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The master car builder and the master mechanic are primarily mechanical officers. Necessarily they are more intensely concerned with the work of their own departments than with other phases of railroad management and operation. But in a broader sense they are railroad officers. Therefore, they are concerned with everything that affects the railroad business. What can be done in the shops depends upon how much money the railroad can put at the disposal of the mechanical officer; how much money can be put at the disposal of the mechanical officer depends upon how much can be earned and raised by the sale of securities; and how much can be raised in these ways depends now largely on the attitude of the public toward the railroads and on the railroad regulation policies of public authorities. In these circumstances, it behooves the mechanical officer, as well as the operating officer and the traffic officer, to take more interest than they ever have before in the public relations of the railroad. It is going to require a long, hard campaign of education to develop a public sentiment that will cause public officials to quit attacking railroads and give their managements a chance to so conduct them as to further the best interests of their employees, their owners and the country. Railroad mechanical officers are in a good position to take part effectively in this campaign. They come frequently in contact with the manufacturers of railroad supplies and their representatives. They are constantly in touch with large bodies of employees. They are located in cities and towns throughout the country and can meet and influence the leaders of public opinion in many communities, great and small. They are not chargeable with any of the mistakes and offenses, such as excessive political activity in the law departments, rebating in the traffic departments, and dubious financiering by some of "the men higher up," that have helped to get the railroads into their recent trouble. They are men who are used to vigorous and exact thinking. The amount of good that could be accomplished in a quiet way by a large number of men of such trained intelligence and high character scattered throughout the country in creating a public sentiment toward railroads more reasonable and friendly, can hardly be overestimated. As mechanical men, the master car builder and master mechanic may think that they have nothing to do with the public relations of the railroad. As railroad men and citizens they have an opportunity to help improve the relations of the railroad to the public that they cannot afford to neglect.

The beautiful weather in Atlantic City on the day preceding the opening of the Master Car Builders' convention vindicated—temporarily, at least—the wisdom of the decision to hold the 1908 mechanical conventions one week later than in previous years. Last year it was so chilly during the early days of the conventions that the heaviest outer garments were needed and for the first time in twenty years' experience of the Daily a heating plant had to be installed in its booth, an oil stove being drafted in this capacity. It was not only chilly, but it was cloudy, damp and in every way as disagreeable as could be made by the weather man at this resort when he is in most disagreeable mood; and as those who were here last year can testify, he in his most disagreeable mood is a wonder. Yesterday was in the most striking contrast to the first day of the 1907 convention. It rained pitch-forks, an assortment of other agricultural implements on Monday night, and even at bed-time—which is somewhat later at Atlantic City than at some other places—the prospect for an auspicious opening day was distinctly unpromising. But on Tuesday morning the sun rose resplendent over a placid sea. The storm of the night before had washed the boardwalk and cleared and freshened the atmosphere without making it humid. It was an ideal summer day and it was enjoyed by everybody here. And it should have been enjoyed by the Atlantic City weather man to a peculiar degree, because it saved his life; there are some outrages too gross for even railroad men to stand. A continuance of yesterday's weather will redeem the local rainmaker's reputation and contribute more than anything else could to making the conventions enjoyable as well as successful in a purely practical way.

Twenty years ago the Master Car Builders' convention was held at Alexandria Bay, Va., and William McWood of the Grand Trunk was president. The secretary, M. N. Forney, reported 139 active and 89 representative members and the number of cars represented as 700,000. The number represented this year is nearly three times as many, 2,027,000. Prior to 1888, the convention decided by vote on the place of next meeting, but at this meeting the method was changed and the by-laws amended so that the place of meeting was determined by a joint committee of the two associations. At the convention in 1888 a committee made a report on a standard axle for 60,000-pound cars and recommended one with a journal 4¼ by 7½ inches, this being submitted to letter ballot. A report on cast iron wheels was presented giving the result of a joint meeting of committees of the Cast Iron Wheel Makers' Association and of the Car Builders' Association. The wheel makers were represented by W. H. Barnum, W. W. Snow and John H. Bass and the master car builders by J. N. Lander and J. N. Barr. At this meeting also

the executive committee reported the result of the letter ballot by which the Janney type of coupler had been adopted, 474 in favor and 194 against, the margin above the necessary two-thirds vote being only 28 and smaller than is the general impression at present. The report contains the letter from the Janney Car Coupling Company to Edward B. Wall, chairman, which says: "In the event of the adoption by the Master Car Builders' Association of the coupler lines of the coupling faces of the Janney car coupler as the representative lines of the M. C. B. type, the Janney Car Coupling Company agrees to waive all claims for patent on contour lines of coupling faces of car couplers used on railroads members of the M. C. B. association."

MATTHIAS N. FORNEY---SECRETARY.

M. N. Forney died in New York on January 14, 1908, and on account of his long and useful service in the interest of the Master Car Builders' Association it would seem fitting that this convention should now make formal recognition of that important work by holding a memorial service or by some more notable action than the perfunctory passing of resolutions.

Mr. Forney joined the association in 1873 and he was secretary from 1882 to 1889, inclusive, and in that office he was not content to be an ordinary recorder but he was really a constitutional lawyer, and it was his constructive genius which brought about the reorganization of the association and the adoption of the new constitution at Niagara Falls in October, 1882. At the New York meeting in June, 1881, John Kirby presented a resolution relating to a proposed amendment of the constitution providing for the appointment of representative members and the adoption of standards by votes of members in proportion to the number of cars owned by the railroads represented. This was referred to a committee and at the convention in June, 1882, Mr. Forney read the report, and in discussing it he said: "There has never been a measure brought before this association which concerns its future success and usefulness so much as this one, and if carried through will extend the usefulness of the association to an extent which nothing heretofore has been able to effect."

He prepared the resolution, providing for the special meeting at Niagara Falls in October of the same year, for the purpose of reorganizing the association and the adoption of a new constitution. He also conducted the voluminous correspondence with many prominent railroad presidents and managers which resulted in a large attendance at the October meeting of members who brought with them the credentials favoring representative membership. The report of the committee on constitutional amendment presented at Niagara Falls was made by W. T. Hildrop, Leander Garey and M. N. Forney; they found that a thorough revision seemed to be required, and submitted a draft of a new constitution and by-laws.

The discussion of that report occupied two days and the work of revision was done so thoroughly and with so much intelligence that the code then adopted has, with a few minor changes, been the one under which the affairs of the association have been conducted for more than 25 years. That reorganization which has resulted in the remarkable growth of the association both in numbers and in usefulness was carried through in the face of strong opposition, and it was fortunate that the membership then included such broad-minded men of marked ability as the members of the committee and H. Stanley Goodwin, J. H. Raymond, F. D. Adams, J. W. Marden, Howard Fry, W. R. Davenport and F. M. Wilder, who took a prominent part in the discussion.

It was Mr. Forney's initiative which carried on the preliminary work which led up to this historic meeting and it was his persistence and tact which carried through successfully the adoption of a constitution making radical changes in the government of a conservative body. At that time the association numbered 200 members and 257,000 cars were represented. The last report of the secretary shows a total membership of 614 and the number of cars represented, 2,254,397. The association has prospered under the new constitution and the numerous standards adopted under its provisions have resulted in large economies for the railroads, and the memory of one who labored so earnestly to bring about this large measure of usefulness should be honored by some special and appropriate action during this convention.

PER DIEM AND STANDARD PRICES.

Considerable attention has been given recently to discussion of the proper basis for per diem charges to be paid for the use of foreign freight cars and the commission appointed by the American Railway Association to report upon this subject is investigating the cost of car repairs as a part of the problem. No matter whether a variable rate or a fixed rate shall be adopted, the item of repairs is an important factor and virtually the only one that requires basic data not already well known; the proper values of the other items of interest, depreciation, taxes, insurance and profit which may enter into the per diem rate are either known or can be determined from general considerations. As car repairs are of two classes, general repairs which are made almost invariably by the owner, and running repairs, which are made by the road on which the car chances to be when the necessity for repair develops, and as running repairs are further subdivided into owners' repairs and those for which the road in possession of the car is responsible, it is apparent that the working of a variable per diem rate or a pooling agreement designed to secure increased economy and efficiency by reducing the amount of empty mileage, will be affected largely by the standard prices in the Master Car Builders' rules. The standard prices will affect not only the cost of owners' repairs made by foreign lines, but will also determine whether there will be needless empty mileage made in order to send cars home for general repairs.

Master Car Builders' prices as a rule have been kept a trifle above the actual cost of the material and labor, though perhaps they would all be found low were there the same allowance for overhead charges as would be made by a manufacturing company. Costs are not uniform in all parts of the country, and the Western lines have complained for years that the costs of owners' repairs made by them on foreign cars were greater than the amounts they could bill under the M. C. B. rules. At the convention in 1899 a committee which had investigated the matter of "Compensation for Car Repairs Done West of the One Hundred and Fifth Meridian" reported that while the western lines were losing money on owners' repairs to foreign cars there was substantial justice done, since the rate of six mills per mile then paid for the use of foreign cars did not cover the cost of maintenance by the owner; the committee also found that were additional compensation allowed for repairs west of Denver, there should be other gradations to meet conditions in other geographical subdivisions. While the western lines have complained that M. C. B. prices are too low, other roads have been charged with engaging in the car repair business to the disadvantage of the car owners because the M. C. B. prices were so high as to make that profitable. As said by the M. C. B. committee 10 years ago the M. C. B. prices and per diem rates are inseparable, and the work of the per diem commission may be expected to involve changes in the M. C. B. rules.

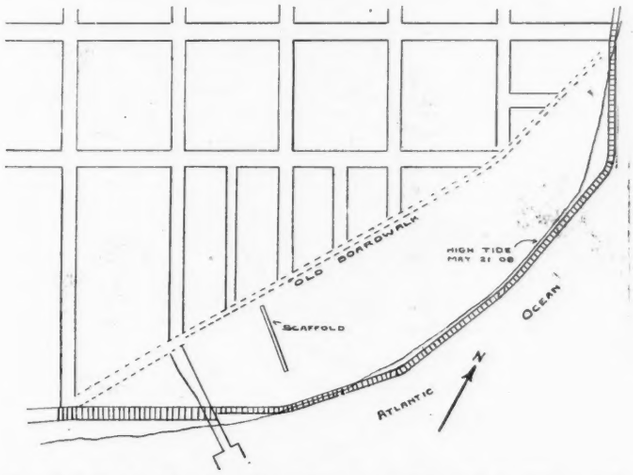
A principal reason for adopting, some 30 years ago, M. C. B. standard prices was to restrain these companies which seemed disposed to make unreasonable profits on repair work. A certain remedy for that as well as for the difficulties of the present system would be the strict application of the golden rule.

THE USE OF CONCRETE PILING IN THE BOARDWALK AT ATLANTIC CITY.

BY ALDRICH DURANT, A. B., B. S.*

The boardwalk is Atlantic City's most widely known feature and undoubtedly it contributes more to the success of that resort than any other of its many attractions. Recognizing this fact, the city has spared neither trouble nor expense to make the boardwalk the finest structure of its kind in the world. As a result of this policy it has developed from an irregular, uneven plank walk, maintained by private individuals and subject to frequent washouts by the sea, into a broad, level promenade. Elevated above the reach of the tides, it stretches for miles along the ocean front and affords, both winter and summer, an unequaled place of recreation for hundreds of thousands of visitors.

In 1896 the greater part of the walk was rebuilt, steel piling and caps being substituted for the wood piles previously employed. The moist, salt air of Atlantic City corrodes iron or steel with amazing rapidity and the fine sand which drifts like snow in every wind forms a most effective sand blast in removing any protective coating of paint. In 1907 it was decided to relocate a section of the boardwalk, near the inlet, where the ocean had receded some four hundred feet.



Boardwalk at Atlantic City—Figure 1, Plan of Improvement.

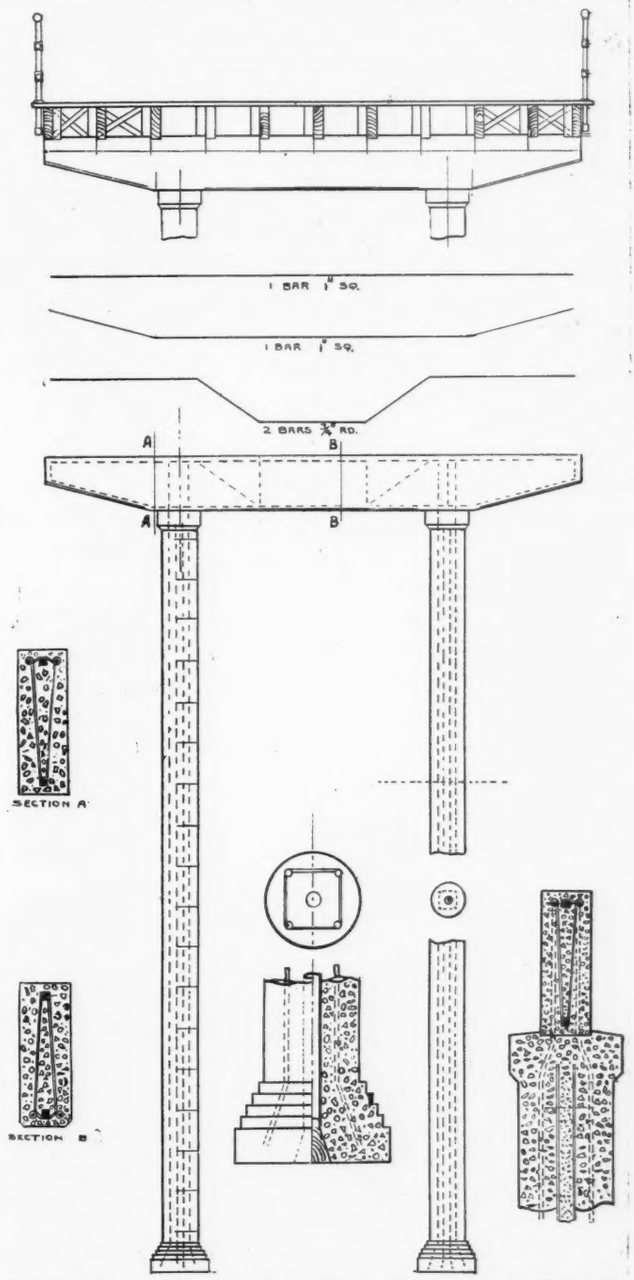
By this time the steel had become corroded to such an extent as to make the safety of the old boardwalk doubtful. In addition, the blistered and scaly appearance of the metal made the structure unsightly. Concrete had been used effectively for protecting the steel piling under some of the amusement piers (The Daily Railway Age, June 14, 1906, page 972) and therefore, from both practical and esthetic viewpoints, it appealed to those in charge of the walk as the best material for the new construction.

Plans and specifications were drawn up by J. W. Hackney, city engineer, bids were invited, and, in January, 1908, the contract was awarded to the Raymond Concrete Pile Company, of New York and Chicago.

Figure 1 shows the plan of the work as executed. Figure 2 shows in detail the design of the construction as adopted—reinforced concrete piles and girders, with stringers and decking of wood.

The piles were especially designed with a view to best meeting local conditions. As the boardwalk forms part of an architectural scheme for beautifying the city it was essential that the piles be round and cylindrical, ornamental as well as useful. This factor precluded the use of the standard Raymond concrete pile, which is made by placing a sheet steel shell through the means of a tapering collapsible iron cone and filling the shell with concrete.

As no reliance was placed on the frictional resistance of the sand on the sides of the pile the base was enlarged to afford a greater bearing area. It then seemed probable, in consideration of the greater area of the base, that the sand would not settle closely under the foot of the pile after it had been jetted into place, causing subsequent settlement. While it is customary to drive piles to refusal after jetting is finished,



Boardwalk at Atlantic City—Figure 2, Design of Concrete Piling.

in all cases where piling is driven into sand by means of a water jet, this obviously could not be done with a pile of the design used.

It was therefore decided to prevent future settlement by compacting the sand under the pile in the following manner: A piece of 2½-inch pipe was cast into each pile, extending throughout its full length. The lower end was closed with a tapered wooden plug and the upper end with waste to prevent the admission of concrete. After the pile had been placed the plug

*Superintendent of Construction, Raymond Concrete Pile Company; Junior Member American Society of Mechanical Engineers.

was knocked out and sand rammed under the foot of the pile, as will be explained further on. As the pipe projected some four inches beyond the top of the pile it likewise served in suspending the pile vertically in the pile driver leads.

The piles were 16 inches in diameter and of two lengths, 28 feet and 32 feet, the shorter lengths being used in the

Boardwalk at Atlantic City—Figure 4, Concrete Mixer, Run and Stock Piles.

more protected portions of the walk and the longer in sections where the chances of erosion were greater. The elevation of the deck of the walk is 15 feet above mean low water and the piles are driven 15 or 19 feet, depending upon the location. This gives a depth in the sand of from 20 to 25 feet and precludes any likelihood of the piles being disturbed by storms or the shifting of the beach through the action of wind or sea.

The walk is 41 feet wide for a distance of 600 feet and then narrows to 21 feet. The wider section is supported on 4-pile bents, 20 feet on centers, the piles being 10 feet on centers, and the narrow section on two pile bents with the same spacing. The caps or girders are 8½ by 24 inches in section with a 5-foot cantilever at each end. The design is simple but, as shown in Figure 2, the proportion and general effect are pleasing.

Boardwalk at Atlantic City—Figure 5, Filling the Columns.

As reinforcement, plain, round or square rods were used throughout, the column reinforcing consisting of four ¾-inch round rods, hooped at intervals of 18 inches, with ¼-inch round iron. The 2½-inch pipe mentioned, while not calculated as a part of the reinforcement, undoubtedly adds much to the strength of the pile. The girders were reinforced with two 1-inch square rods and the two ¾-inch round rods, bent as shown in Figure 2. No stirrups were used. The rods of the columns projecting up into the girder for a distance of 18 inches gave a good bond.

The contractors' equipment consisted of scaffold or trestle for casting the piles, batch mixer, hoist, industrial railway and cars for moving the piles, pile driver and jetting apparatus and a force pump for supplying water to the jets.

As shown on the plan, Figure 1, nearly the whole line of the work was at or below high water mark and consequently subject to the effects of storms or high tides. On this account the contractors obtained permission to depart from the original specifications which called for the molding and sinking of the piles in sections at the site. Each pile was therefore molded entire, off the line of work. In this way the use of a very satisfactory equipment was made possible and much better results were obtained. Because of the fact that each pile was cast entire and in one mold, joints and the danger of washed concrete from the chance admission of sea water were eliminated and a perfect alignment was obtained.

The somewhat unusual equipment necessary for molding these piles is illustrated in Figure 3. The scaffold, or trestle, as shown, served as a bracing for the forms, a run-way for distributing the concrete and a substitute for a derrick or gin pole when lowering the piles. It was made of 46 bents,

Boardwalk at Atlantic City—Figure 6, Lowering a Completed Pile.

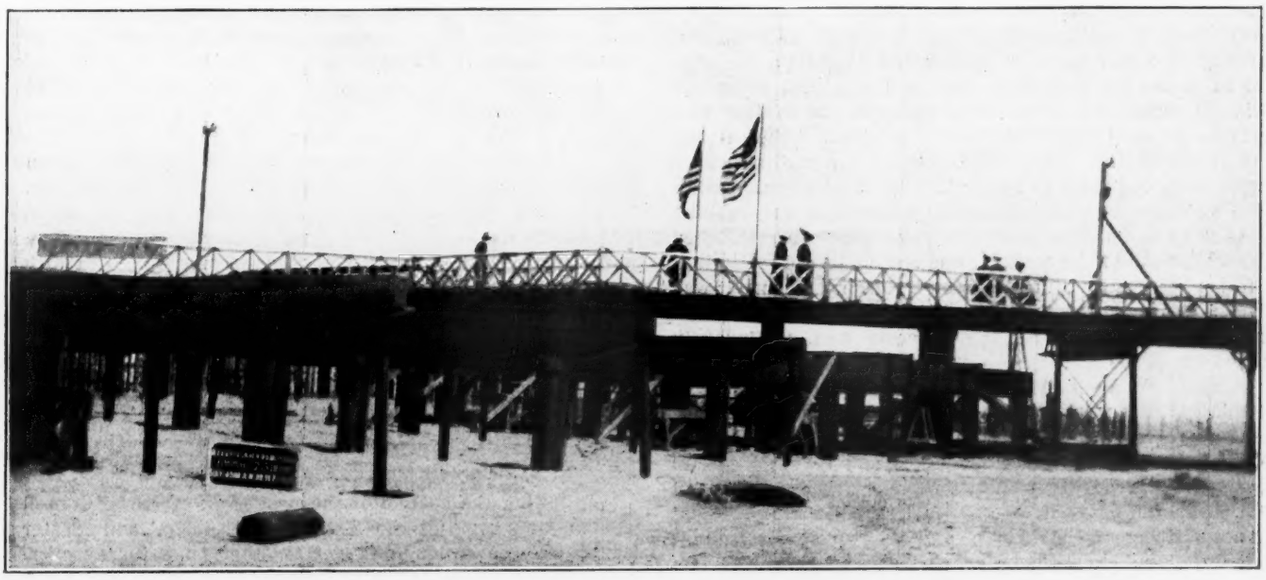
spaced five feet on centers, and giving 45 spaces for molds on each side, a total of 90. It was 34 feet high, 225 feet long and 12 feet broad, and was graded away from the hoisting end to facilitate wheeling. Guy ropes were carried down to the ground at 40 foot intervals on each side, giving great stiffness to the structure.

The design of the forms for molding the columns was carefully worked out and the molds proved satisfactory in every way. They were made of No. 16 gauge sheet iron rolled to the proper cylindrical shape and screwed to wood braces. They were made in halves and bolted together with butt joints. Some difficulty was anticipated in handling the molds since they were 32 feet in length but by careful design, building, and handling no trouble whatever was experienced in fitting them together or maintaining true alignment even after using each one some twelve times. They were always kept in a vertical position and were moved by means of a pivoted lever on top of the scaffold which lifted the mold with a chain and shackle hooked into the top, swinging it clear of the ground. By pivoting the lever the mold could then be swung around outside the scaffold, bringing it into its next position.

Thirty molds were used, distributed in each third space about the scaffold.

In rotation each mold occupied three different spaces, the method of working being as follows: When the first column could be stripped, generally in two or three days, the mold was removed and swung into the next space, cleaned,

greased, bolted together and filled. After a three days' interval it was moved into the third space. The average time from casting column No. 1 until Column No. 3 was ready to strip was from nine to ten days. At the end of that time column No. 1 could be removed and the mold returned to its first position. In this way the moving and handling of molds was reduced to a minimum.

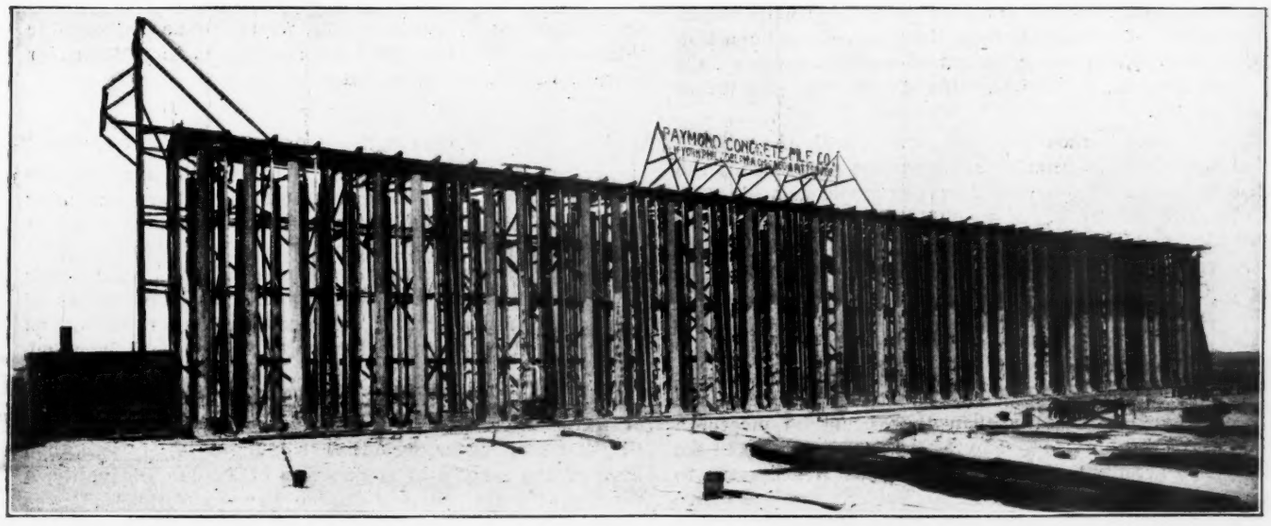


Boardwalk at Atlantic City—Figure 3, Molding Scaffold for Piles.

All concrete was mixed in the proportion of 1-2-4, using Alpha cement, washed sand and screened gravel about ½-inch in diameter. This small gravel was used in order to make the concrete easier to puddle. A ¼-yard Chicago mixer was used, mixing a one bag batch at a time. This was dumped direct into wheel-barrows which were then wheeled about ten feet to the hoist. The arrangement of the mixer, runs and stock piles is shown in Figure 4. A single drum hoist, operated from the mixer boiler, served to elevate the concrete to the scaffold floor. The hoist platform was wide enough for two barrows, one man taking off a full barrow and leaving an empty one.

The narrow gauge industrial railroad proved a great labor saver. For moving the piles, two platform cars were fitted with turn-tables, making it possible to swing a pile to any angle from the track. This was found necessary to aid in loading the columns on the cars and in picking them up by the driver. A dump car was used to distribute material for the caps and girders. All lumber was moved on the flat cars.

The pile driver was a standard Raymond machine, consisting of a double drum engine and 50-foot derrick, mounted on a swinging platform. For this work a special bed sill was built and mounted on double flanged wheels to travel on rails, owing to the distance which had to be traversed. One drum was used for the main purchase which lifted the pile and held it in place during the process of jetting and the other for swinging the machine. The jet lines and the line for pulling back or ahead were handled on winch heads.



Boardwalk at Atlantic City—Figure 7, View of Completed Bents.

A pumping outfit was installed for supplying water. This consisted of a Worthington 8 and 12 by 7 by 10 compound pump, and a 30-horsepower vertical boiler. A pump house was built on an old jetty on the beach and a suction line

run out into the ocean. Water was delivered at about 100 pounds pressure through a maximum length of 1100 feet of pipe. Owing to the exposed position of the beach and its shifting nature considerable trouble was experienced in maintaining the suction line. At times the height of the sand at the intake would vary as much as two or three feet over night.

The method of filling the columns is well shown by Figure 5. Great care was taken in mixing and depositing the concrete to insure freedom from voids and to obtain a smooth finish. To this end the amount of water in the mixture was varied as the mold was filled, the first mixture, at the bottom, being very wet, and succeeding batches dryer until no water showed when the top was reached. The careful construction of the molds made them practically water-tight and enabled this gauging to be done with accuracy. The concrete, after reaching the top of the scaffold, was not dumped directly into the forms but was first turned out on a platform whence it was shoveled into the form, thus ensuring a perfect mixture. During the process of filling the concrete was continuously puddled by means of rammers extending the entire depth of the column. As a result of these precautions not one of the 360 columns cast was found in any way defective.

The problem of moving the piles after they had been molded presented numerous difficulties and required careful planning. The weight of the pile, some 7,000 pounds, and its great length, together with the fact that the reinforcement was not sufficient to enable it to carry its own weight, made it most unwieldly. Even when supported at two points, one-fourth of the length from either end, the stresses on the steel and concrete were far in excess of those allowed by the best building practice. This difficulty was overcome in the manner shown in Figure 6, which shows a pile in the process of being lowered away from the scaffold to one of the turntable cars.

Two slings were placed on the pile at the points which would afford the most even distribution of the stress. Into these was hooked a short wire cable on which a snatch block travelled. This block in turn engaged one end of a tackle, the other end of which was made fast to the scaffold. A fall line was led down to a hand winch, a strain taken, and the head of the column pushed out from the scaffold until caught by the tackle. By slacking off on the winch the column was allowed to swing out into a horizontal position, turning on a sill under the foot, as a hinge. This sill also took the thrust of the column.

The industrial track was laid parallel with the scaffold and at such distance from it that when the pile reached the horizontal position its center of gravity would coincide with the center of the track. A cradle 16 feet long, with 2-inch pillow blocks at each end was laid on the turntable car and, as the column descended, received the load without jar or shock. Once landed on a car, the slings were removed and the column and cradle swung round on the car to a position parallel to the track. In this position it was taken to its destination.

Since it was found to be more economical to cast the piles with greater rapidity than they could be placed, a storage yard was provided. The track was so graded, and the skidway so arranged, that at no time was it necessary to lift the piles before reaching the pile driver. From the time of casting until delivered they were either moving on a level or down grade.

On arriving at the pile driver the piles were swung into a vertical position by a process the reverse of that just described, using the main purchase to lift them. A hanger, or suspension rigging, was screwed into the projecting end of the central pipe. After reaching a vertical position the purchase was hooked into this and the slings removed so that the pile might hang free and vertical in the lever.

The machine was then swung so that the pile hung directly over the stake. Two streams of water were used to open the hole for the pile which settled by its own weight when pure sand was encountered. Frequently, however, a stratum of clay had to be penetrated. There it was necessary to lift and drop the pile, letting it pound its own way through. This process also served to enlarge the hole and keep it open. The jetting was continued until the pile was swung free and clear in the correct position and plumb. The jets were then withdrawn. In the course of two or three minutes the sand would settle sufficiently to hold the pile.

Forty-eight hours after jetting the piles they wer settled in the following manner: A piece of 2-inch shafting, two feet longer than the pile was introduced into the central pipe and alternately raised and dropped, knocking out the wooden plug and compacting the sand under the foot of the pile. This process was continued until the pile ceased to settle, from two to six inches of settlement usually occurring. When no further settlement was perceptible the pipe was filled with concrete and a cap molded onto the column to the exact grade required.

From the various engravings shown a general idea of the appearance of the piles and girders may be obtained. The final results were most satisfactory, the finished structure presenting a pleasing and substantial appearance.

Cornell Men at the Conventions.

Following the custom of the past two years, the Cornell men in attendance at the Master Car Builders' and Master Mechanics' conventions will get together on Saturday evening, June 20, for an informal dinner and general good time. All Cornell men who can be there on that day are requested to register at the booth of the American Engineer and Railroad Journal, near the entrance to the pier. An entertainment, in the shape of music and musical stunts, will be provided during and after the dinner. It is announced that the expense will be considerably less than at former dinner and it is hoped that every Cornell man in Atlantic City on the evening of June 20 will be on hand. The place of the meeting will be announced later. In a circular issued recently by E. A. Averill, secretary of Cornell Association, there are listed the names of 145 Cornell men who are in the railroad and the railroad supply business. Mr. Averill wishes to complete this list and will appreciate information as to additions or corrections that should be made.

Purdue Railroad Association.

It has been the custom for a number of years for the representatives of various technical institutions, including alumni, members of the faculty and students who are in attendance at the M. C. B. and M. M. Conventions, to meet at a dinner for the renewal of old acquaintances, talking over of college days and a general good time. The number of alumni of various technical universities at these conventions has increased rapidly in the last few years, because of the prominence which these institutions have given railway work and the large number of graduates who have gone into the employ of railways or of railway supply companies. At Atlantic City last year, under the initiative of Dr. W. F. M. Goss, then dean of the schools of engineering of Purdue University, a permanent organization of Purdue men was formed. It was decided to arrange for a dinner at the present convention and to perpetuate this custom. The officers of the association are: Honorary chairman, Dr. W. F. M. Goss; president, E. E. Silk; vice-president, F. B. Ernst; secretary, J. H. Jaścka. The association will have its annual dinner this year on the evening of Saturday, June 20, and the place will be announced in a later issue of the Railroad Age Gazette.

B. A. Hegeman, Jr., and Geo. L. L. Davis, manager of sales of the U. S. Metal & Manufacturing Company arrived yesterday.

OFFICERS OF THE MASTER MECHANICS' ASSOCIATION FOR 1907-1908.

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C. A. Seley, Chicago Rock Island & Pacific, Chicago, Ill.
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F. M. Whyte, New York Central Lines, New York, N. Y.

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Treasurer—John Kirby, Adrian, Mich.

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T. H. Curtis, Louisville & Nashville, Louisville, Ky.
J. F. Walsh, Chesapeake & Ohio, Richmond, Va.
F. N. Hibbits, Lehigh Valley, South Bethlehem, Pa.
F. T. Hyndman, New Haven, Conn.

Secretary—Jos. W. Taylor, 390 Old Colony Building, Chicago, Ill.

PROGRAMME—M. C. B. ASSOCIATION.

First Session.
Wednesday, June 17, 1908, 10:00 a.m. to 1:30 p.m.

Prayer ..... 10:00 a.m. to 10:05 a.m.
Address of president ..... 10:05 a.m. to 10:15 a.m.
Intermission to permit visitors to retire, although all are requested to remain ..... 10:15 a.m. to 10:20 a.m.
Reports of secretary and treasurer .... 10:20 a.m. to 10:30 a.m.
Assessment and announcement of annual dues; appointment of committees on "Correspondence," "Resolutions," "Nominations," "Obituaries," etc. ..... 10:30 a.m. to 10:40 a.m.
Election of auditing committee ..... 10:40 a.m. to 10:45 a.m.
Unfinished business ..... 10:45 a.m. to 10:50 a.m.
New business ..... 10:50 a.m. to 11:00 a.m.
Discussion of reports on:
- "Revision of Standards and Recommended Practice," exclusive of "Protection to Trainmen". 11:00 a.m. to 11:15 a.m.
- "Triple Valve Tests" ..... 11:15 a.m. to 11:30 a.m.
- "Brake Shoe Tests" ..... 11:30 a.m. to 12:00 m.

Topical discussion:
- "Stresses to which Car Wheels are Subjected." To be opened by Geo. L. Fowler ..... 12:00 m. to 1:00 p.m.

Discussion of report on "Tests of M. C. B. Couplers" ..... 1:00 p.m. to 1:30 p.m.
Adjournment.

Second Session.
Thursday, June 18, 1908, 9:00 a.m. to 1:30 p.m.

Discussion of reports on:
- "Revision of Rules for Loading Long Materials" ..... 9:00 a.m. to 9:15 a.m.
- "Cast Iron Wheels" ..... 9:15 a.m. to 10:00 a.m.
- "Rules of Interchange," including decisions rendered during the year by the "Arbitration" committee, and report of "Arbitration" committee on "Revision of both Freight and Passenger Car Rules" ..... 10:00 a.m. to 10:15 a.m.
- "Journal Box and Pedestals for Passenger Cars with Journals 5 by 9 and 5½ by 10 inches". 10:15 a.m. to 10:30 a.m.
- "Marking of Freight Equipment Cars" ..... 10:30 a.m. to 10:45 a.m.
- "Air Brake Hose" ..... 10:45 a.m. to 11:00 a.m.
- "Automatic Connectors" ..... 11:00 a.m. to 11:15 a.m.
- "Bracing of Steel Freight Cars". 11:15 a.m. to 11:30 a.m.
- "Side Bearings and Center Plates". 11:30 a.m. to 12:00 m.

Topical Discussions:
- (1) "Manganese or other special steel coupled knuckles. Does it pay to use them? If so, what is the difference in cost from other steel knuckles?" To be opened by S. P. Bush ..... 12:00 m. to 12:30 p.m.
- (2) "The abolishment of the brake beam safety chain." To be opened by J. J. Hennessey ... 12:30 p.m. to 1:00 p.m.

Discussion of report on "Steel Passenger Cars" ..... 1:00 p.m. to 1:30 p.m.
Adjournment.

Third Session.
Friday, June 19, 1908, 9:00 a.m. to 1:30 p.m.

Discussion of report on:
- "Ventilation and Heating Passenger Cars" ..... 9:00 a.m. to 9:30 a.m.
- "Protective Coatings for Steel Cars" 9:30 a.m. to 9:45 a.m.
- "Location of Ends of Running Boards" ..... 9:45 a.m. to 10:00 a.m.
- "Protection of Trainmen" ..... 10:00 a.m. to 10:30 a.m.
- "Side Door and End Door Fixtures" ..... 10:30 a.m. to 10:45 a.m.
- "Tank Cars" ..... 10:45 a.m. to 11:00 a.m.
- "Subjects" ..... 11:00 a.m. to 11:15 a.m.

Unfinished business:
- Reports of committees on "Correspondence," "Resolutions" and such other committees as may be named during the convention ..... 11:15 a.m. to 12:00 m.

Topical discussions:
- (1) "Should journals of standard axles when fillets are partially worn, be made longer in order to get in a full size fillet? If so, what should be the limit of the length of journals?" To be opened by W. E. Fowler... 12:00 m. to 12:20 p.m.
- (2) "The advantages and disadvantages of the all-steel box cars." To be opened by W. R. McKeen, Jr. ..... 12:30 p.m. to 1:00 p.m.

Election of officers ..... 1:00 p.m. to 1:30 p.m.
Adjournment.

PROGRAMME—MASTER MECHANICS' CONVENTION.

First Session.
Monday, June 22, 1908, 9:30 a.m. to 1:30 p.m.

Prayer ..... 9:30 a.m. to 9:35 a.m.
Address of president ..... 9:35 a.m. to 10:00 a.m.
Intermission to allow visitors to retire, although all are requested to remain ..... 10:00 a.m. to 10:05 a.m.
Action on records of 1907 convention... 10:05 a.m. to 10:10 a.m.
Reports of secretary and treasurer..... 10:10 a.m. to 10:20 a.m.
Assessment and announcement of dues; appointment of committees on "Correspondence," "Resolutions," "Nominations," "Obituaries," etc. ..... 10:20 a.m. to 10:25 a.m.
Election of auditing committee..... 10:25 a.m. to 10:30 a.m.
Unfinished business ..... 10:30 a.m. to 10:35 a.m.
New business ..... 10:35 a.m. to 10:45 a.m.
Discussion of reports on:
- "Mechanical Stokers" ..... 10:45 a.m. to 11:00 a.m.
- "Blanks for Reporting Work on Engines Undergoing Repairs". 11:00 a.m. to 11:15 a.m.
- "Proper Width of Track on Curves to Secure Best Results with Engines of Different Lengths of Rigid Wheel Base". ..... 11:15 a.m. to 11:30 a.m.

Discussion of individual paper by Lawford H. Fry, on "Design and Strength of Crank Axles for Balanced Compound Locomotives".... 11:30 a.m. to 12:00 m.

Topical discussions:
(1.) "Alloy steel; results from use in machine tools and special cutters." To be opened by J. A. Carney.....12:00 m. to 12:30 p.m.
(2.) "The smoke nuisance; what is the best method of preventing it?" To be opened by H. T. Bentley.
Discussion on report on "Washing Out and Refilling Locomotive Boilers... 1:00 p.m. to 1:30 p.m.
Adjournment.

Second Session.
Tuesday, June 23, 1908, 9:30 a.m. to 1:30 p.m.

Discussion of Reports on:
"Castle Nuts" ..... 9:30 a.m. to 10:00 a.m.
"The Apprenticeship System".....10:00 a.m. to 11:00 a.m.
"Superheating" .....11:00 a.m. to 11:30 a.m.
"Mallet Compounds" .....11:30 a.m. to 12:00 m.
Topical discussions:
(1.) "The proper and best method of caring for hand lamps. markers and classification of lamps on locomotives." To be opened by D. J. Redding.
(2.) "Use of non-combustible engine house jacks of wood or other material." To be opened by R. D. Smith.
Discussion of report on "Briquetted Coal" ..... 1:00 p.m. to 1:30 p.m.
Adjournment.

Third Session.
Wednesday, June 24, 1908, 9:30 a.m. to 1:30 p.m.

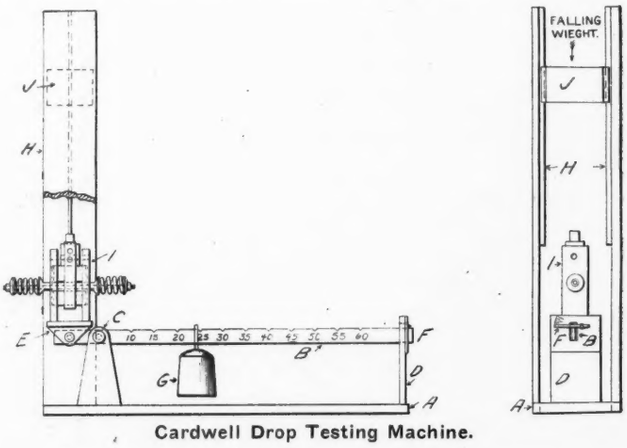
Discussion of reports on:
"Balanced Compounds" ..... 9:30 a.m. to 10:00 a.m.
"Sizes and Capacity of Safety Valves for Use on Locomotive Boilers" .....10:00 a.m. to 10:30 a.m.
"Revision of Standards".....10:30 a.m. to 10:45 a.m.
Individual paper on "The Training of Technical Men," Prof. A. W. Smith, Cornell University.....10:45 a.m. to 11:30 a.m.
Discussion of reports on:
"Subjects" .....11:30 a.m. to 11:45 a.m.
"Correspondence," "Resolutions," etc. .....11:45 a.m. to 12:00 m.
Topical discussions:
(1.) "Standardization of locomotive parts." To be opened by G. R. Henderson.
(2.) "Advisability of using ball joint unions for air and steam pipe connections on locomotives and tenders." To be opened by C. B. Young.
Election of officers.
Closing exercises ..... 1:00 p.m. to 1:30 p.m.
Adjournment.

The T. H. Symington Company has this year a very interesting exhibit of various locomotive castings made of its "Refined Iron," which is an open hearth furnace product having an average tensile strength of 40,000 pounds per square inch, and resistance to wear from abrasion very superior to gray iron of the best quality. The method of making abrasive tests of this iron, as compared with ordinary cast and malleable iron, has been very ingeniously worked out, and is graphically illustrated on a 24-inch shaper operated in the Symington company's booth at space Nos. 367-377. The superiority of this material over cast iron in withstanding blows is also very clearly shown on what is termed an "Impact Testing Machine." Among the locomotive castings exhibited are a pedestal shoe and wedge, eccentric, eccentric strap, engine truck box and cylinder packing rings. The Symington company advises that its "Refined Iron" is exciting a great deal of interest among motive power officials who are desirous of obtaining an iron having good tensile strength and superior wearing qualities, and that it is in a position to furnish this iron in castings of any design and in any quantity, being prepared to submit test pieces for any desired test to show the qualities claimed for this material.

CARDWELL DROP TESTING MACHINE.

The Cardwell Manufacturing Company is exhibiting at its booth on the pier a model of a drop testing machine designed to test the efficiency of draft gears. By reference to the accompanying engraving it will be observed that the machine consists of a base A, on which is mounted a scale beam B. This beam is fulcrumed at the point C; on the rear of the beam close to the fulcrum is mounted a base E, on which the gear I to be tested is placed. The weight J used for the drop test is guided by two uprights H. At the outer end of the beam, a frame D is provided in which a slot is cut allowing the beam to move a distance of 3-16 inch. An indicator is placed at F to mark the movement of the beam. A poise G is mounted on the beam. The figures indicate the number of pounds required when applied on the gear to balance the beam. The test is made by dropping the weight on the gear from different heights, and noting the resulting force in pounds, as indicated on the scale beam.

It will be seen that this testing device differs from the ordinary drop testing machine in several important points. The practice has been to place the draft gear to be tested



Cardwell Drop Testing Machine.

on a solid foundation, and then drop a heavy weight (usually 1640 pounds) on it from varying heights until the gear becomes inoperative.

It is conceded that all of the parts which enter into the construction of the gear should be of sufficient strength to withstand the severest shocks delivered in fair service. Much more than this, however, is demanded of the draft gear. Were strength the only thing to be considered it would be a simple matter to design a gear that would be strong enough to withstand easily the heaviest blows. Such a gear, however, would afford little or no protection to the car. What is required is not only a draft gear that will not break, but a draft gear that will keep the car from breaking.

It is submitted by the Cardwell company that the only true and practical test for determining the efficiency of a draft gear is one that will measure in pounds, the forces transmitted by the gear under impact, and the machine as described was constructed to attain this object.

The draft gear is one of the most important devices in car building that is engaging the attention of railroad mechanical men to-day, and the M. C. B. association could with profit investigate the various types of testing machines with the object of defining a standard apparatus and methods for test of draft gears.

Although the Homestead Valve Manufacturing Company of Pittsburg, Pa., will not have its usual exhibit this year, it will be represented there by P. L. Rhodes, who will be at all times ready to tell of the advantages of the Homestead valve when used for locomotive blow-off or other difficult service.

THE RYERSON AUTOMATIC CRANK PIN TRUING MACHINE.

One of the most expensive and time consuming operations in the railroad shop is the truing of locomotive crank pins, when the work is done in the usual way by chipping and filing, and there are many railroads shop men who remove the old crank pin and replace it with a new one, rather than bear the time and cost burden of filing and chipping the old pin to shape.

Machines which are bolted to the side of the wheel or hub will only square the pin with those parts, and if these are not true with the wheel (on account of distortion caused by pressing on the wheel and shrinking on the tire) the pin cannot be trued in proper alignment. The Ryerson crank pin truing machine has been designed to take its bearing directly on the pin itself and as the crank pin hole is bored after all other work on the wheel is done, the pin must necessarily be in absolute alignment with the axle.

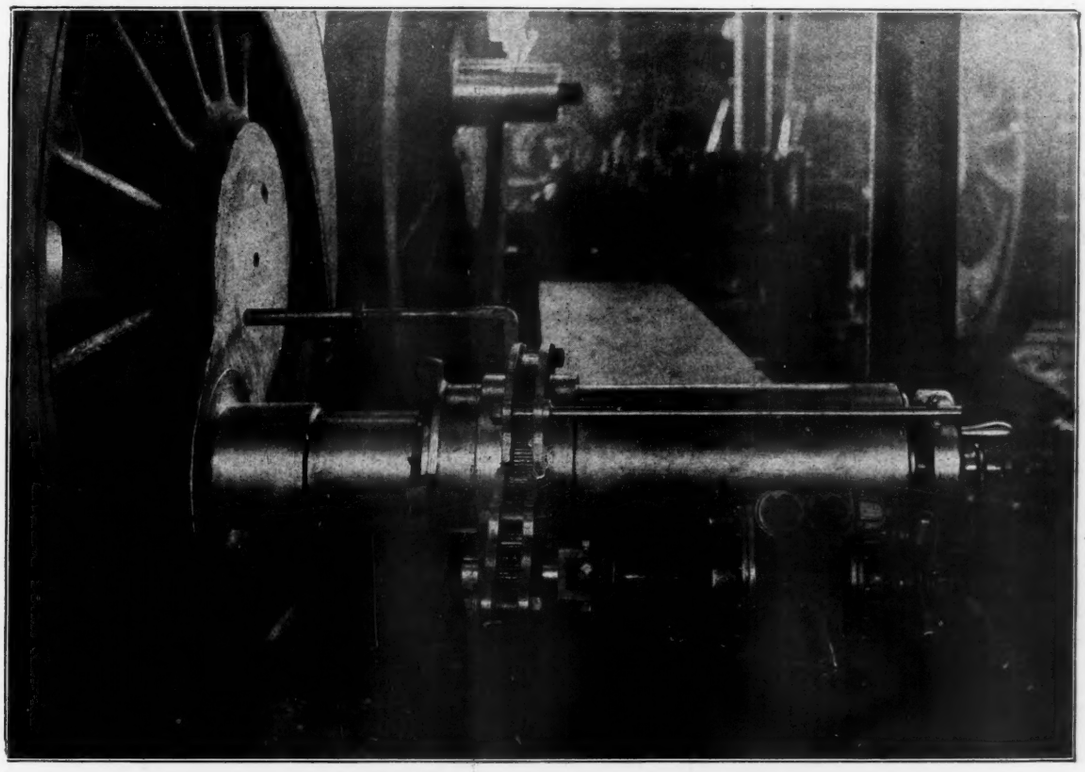
The machine illustrated was designed by a railroad mechanic after several years study of the requirements and a careful investigation of the methods used in various shops throughout the country, and in its manufacture the object has been to make it the most rapid and efficient crank pin truing machine on the market. It is simple in construction and consists of only four parts, no one of which is too heavy to be easily handled by one man.

The accompanying illustration shows the machine as connected to the crank pin and ready for operation. In operating, the barrel of the machine is first secured firmly to the gudgeon screw at the end of the crank pin by means of two handles. These are then removed and the sliding sleeve is placed on the barrel. Attached to this sleeve there are lugs containing the necessary tools for roughing, finishing and filletting the crank pin. These tools are of high speed tool steel. The gearing wheels and casting are then slipped over the two feather keys.

The forward or feed motion of the sleeve is accomplished by means of a hand wheel which is so designed that the feed may be either automatic or done by hand, the arrangement of the feed being such that it is unnecessary to stop the machine in order to engage or disengage the gearing. The sleeve is caused to revolve around the crank pin by means of an air drill or motor, which is the only power necessary in operating.

The machine can be adjusted to any pin having a threaded end by simply making a face plate to suit the pin and threading it to suit the extension. It is also an easy matter to drill the end of the crank pins having collars and insert a gudgeon screw to which the machine can be attached.

This machine can be used in any roundhouse without removing the wheels from the engine, thus prolonging the life of the rods, as well as the brasses. The breaking of many rods has been traced directly to the imperfect condition of the main crank pin and it has been shown that if the main pins are kept in good condition, those in the front and back wheels will require little or no attention and the number of broken rods will be greatly reduced.



The Ryerson Automatic Crank Pin Truing Machine.

The machine complete weighs 350 pounds exclusive of the air motor. Any standard air drill or motor can be used for this operation. The machine is manufactured and sold by Joseph T. Ryerson & Son.

The use of safety treads for car steps and vestibules has been steadily increased as indicated by the shipments from the Lowell factory of the American Mason Safety Tread Company. Material of this nature, particularly the carborundum-filled steel tread is being used by all the more prominent car building concerns. The St. Louis Car Company has been using large quantities of Mason safety tread for car steps including the new cars for the Denver & Interurban Street Railway Company.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.

At the conventions held in Atlantic City last year the railway supply men adopted a new form of organization and changed the name to the Railway Supply Manufacturers' Association. The constitution and by-laws of the new society were published in full in The Daily Railway Age of June 12, 1907. Under the new plan the conduct of the affairs of the association is vested in an executive committee of twelve members representing seven districts. The present membership of the committee by districts is as follows:

R. T. Walbank, President.

First district: (New England States, 1 member) Frank A. Morrison, Mason Regulator Company.

Second district: (New York and New Jersey, 3 members) Alex. Turner, Galena-Signal Oil Company; A. L. Whipple, Forsyth Brothers Company, and Thomas Aldcorn, Chicago Pneumatic Tool Company.

Third district: (Pennsylvania, Maryland, District of Columbia, West Virginia, 2 members) George N. Riley, National Tube Company, and F. L. DeArmond, Protectus Company.

Fourth district: (Ohio, Indiana, Michigan, Kentucky, Tennessee, 2 members) George A. Cooper, Frost Railway Supply Company; A. G. Hollingshead, Ralston Steel Car Company.

Fifth district (Illinois, Wisconsin, Iowa, Minnesota, 2 members) R. T. Walbank, Glidden Varnish Company; W. H. Miner, W. H. Miner Company.

Sixth district: (Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, 1 member) L. O. Cameron, Pressed Steel Car Company.

F. L. DeArmond, First Vice-President.

Seventh district; (States west of Mississippi river, including Louisiana, but excepting Iowa and Minnesota, 1 member) R. H. Weatherly, Scullin-Gallagher Iron & Steel Company.

The by-laws provide that the terms of office of members of the executive commitee shall be three years, and accordingly, there are four members to be elected each year. Those who retire at the close of the present convention are: R. T. Walbank of the fifth district, F. L. DeArmond and George N. Riley of the third district and L. O. Cameron of the sixth district. Messrs. Turner, Morrison, Weatherly and Cooper have two years yet to serve and Messrs. Miner, Whipple, Hollingshead and Aldcorn have three years to serve.

The members of the executive committee are chosen by the members of the association resident in the several districts. The district meetings for the election of new members to succeed those who are now about to retire will be held on Friday of the present week, in accordance with the official announcement of the executive committee. The annual meeting of the association to which the district meetings will report and at which president, vice-president and treasurr will be elected will be held on Saturday, June 20, in the Greek temple at the ocean end of the Million Dollar Pier.

The results of the operation of the first year under the new plan are now visible to the naked eye. And the results are good. The officers and the members of the executive committee have large claims upon the gratitude of everybody connected with the conventions. The exhibits were never in such a state of forwardness at the opening of the convention as they are this morning and there are manifold evidences on every side of good generalship, thorough organization and painstaking labor on the part of the men who have been in charge. President Walbank and his associates have not by any means had an easy job. In spite of difficulties and discouragements they have succeeded in a work that is a monument to their good judgment and their energy.

Special Train over Pennsylvania.

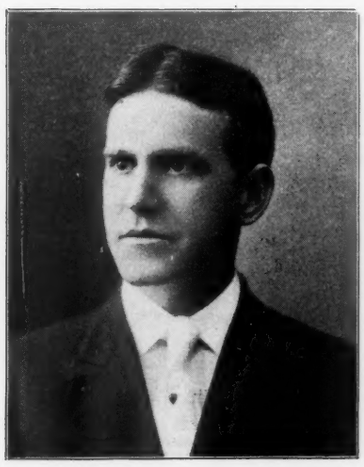
The special Master Car Builders' and Master Mechanics' train run by the Pennsylvania from Chicago to Atlantic City for persons desiring to attend the conventions left Chicago at 3 p.m. on Monday and arrived in Atlantic City at 2:45 p.m. on Tuesday. It was run as the second section of the Pennsylvania Special, the 18-hour train between Chicago and New York, which leaves Chicago at 2:45 p.m. The convention train consisted of nine sleepers and two dining cars, and carried 126 passengers, of whom about 40 were ladies. C. L. Kimball, assistant general passenger agent of the Pennsylvania Lines West at Chicago, went to the Union station in Chicago to see the party off. The party was in immediate charge of F. S. Bamford, city passenger agent at Chicago of the Pennsylvania Lines West. There was a half hour's delay at Harrisburg, while a locomotive was awaited. Otherwise, the trip was devoid of untoward incidents.

The following is a list of the men on the train, many of whom were accompanied by their wives and daughters:

H. W. Finnell, George Wilkinson, C. A. Seley, E. T. Hendee, E. H. Walker, George L. Harvey, W. W. Rosser, S. C. Hanks, G. E. Gemon, William White, M. A. Garrett, C. M. Garrett, Bruce Crandall, C. F. Murray, John Ristine, M. T. Van Dorn, C. M. Baker, Charles Talbott, J. F. DeVoy, C. D. Jenks, T. F. Barton, J. J. Hennessey, F. E. Ebert, George Carr, D. E. Cain, J. D. Purcell, H. J. Small, L. J. Kennedy, W. M. Wilson, C. B. Young, Frank Furry, Charles Spalding, E. H. Gold, H. E. Passmore, J. R. Cardwell, E. C. Woolgar, J. H. Kent, John Tonge, F. H. Clark, L. B. Sherman, W. B. Hall, Charles Ridell, T. R. Cook, F. O. Brazier, C. E. Fuller, C. A. Schroyer, Mr. Van Patten, W. H. Forsyth, W. H. Baldwin, A. E. Manchester, Henry La Rue, C. W. Seddon, W. A. Blanchard, C. B. Moore, Frederick Ingalls, E. W. Pratt, A. C. Hinckley, Peter Peck, P. M. Elliott, E. Hacking, C. H. Cory, J. Waffle, W. E. Sharp, F. A. Gardner, C. H. Pearsall, C. F. Parker, J. M. Hopkins, Sanford Keeler, C. A. Hardy, W. A. Smith, G. L. Walters, George L. Bourne, G. F. Slaughter, W. J. Schlacks, Mr. Swanson, H. F. Luscombe, F. D. Fenn, F. S. Bamford, F. W. Miller, H. L. Winslow, J. H. Maher, C. B. Conger, F. T. DeLong, E. B. Leigh, T. M. Madill and George H. Forsyth.

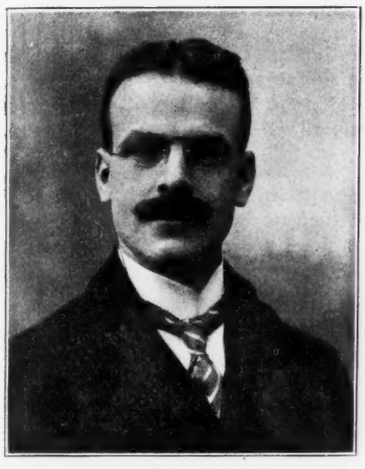
Owing to the excellent acoustic properties of the entrance hall the sonorous tones of the brass band, which played there on Monday and most of Tuesday, rendered it almost impossible for the Enrollment Committee to carry on its work. Consequently the band has been moved to the balcony on the east side of the pier. The seating accommodations in the balcony are ample, and the removal of the band is not only a relief to the Enrollment Committee and those who have business with it, but to every one else in entrance hall who have something to do besides listen to the music.

George N. Riley.



L. O. Cameron.

Alex Turner.

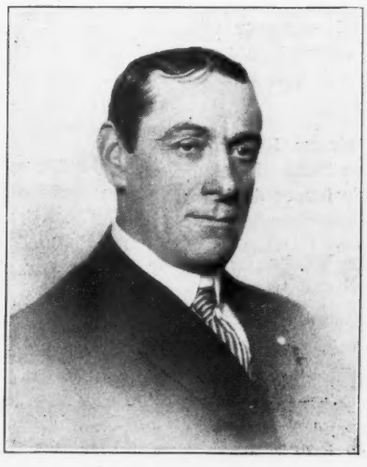


A. L. Whipple.

F. A. Morrison.

A. G. Hollingshead.

R. H. Weatherly.



Thomas Aldcorn.

George A. Cooper.

MEMBERS OF THE EXECUTIVE COMMITTEE OF THE RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.

Conventionalities

Convention Announcements.

The sessions of the convention will be held in the Greek Temple on the Million Dollar Pier.

The Marlborough-Blenheim hotel has been chosen as headquarters. The president, executive committee and secretary will have offices there.

The registration booth will be in the entrance to the pier. Members, immediately upon their arrival, should report at this booth, register and receive the proper credentials. Cards for registration will be furnished at the booth.

A new disc for the M. C. B. button will be furnished when the member registers.

Those members of the M. C. B. association who remain for the Master Mechanics convention should register on the first day of each convention so that a proper record can be made of those in attendance at each convention.

C. F. Parker, purchasing agent of the Illinois Central, with Mrs. Parker, was a passenger on the Pennsylvania special to Atlantic City.

Among the arrivals on Monday were A. P. Storrs, president of the Storrs Mica Company, and Mrs. Storrs. They are stopping at the Brighton.

George H. Sargent lost his train en route and he wired to J. J. McCarthy as follows: "Twenty-six miles off the track. My car replacers working finely."

George L. Bourne will be in charge of the affairs of the Railway Materials Company, Chicago, during the conventions. President W. M. Simpson will not be able to attend.

Mrs. R. T. Walbank, wife of President Walbank, of the Railway Supply Manufacturers' Association, arrived yesterday and joined her husband at the Marlborough-Blenheim.

W. B. Simpson, who has been connected with A. M. Castle & Co., Chicago, for several years, succeeded to the presidency of the company recently made vacant by the death of A. M. Castle.

James E. Minor, of the Nathan Manufacturing Company, a veteran in the services performed in connection with the June conventions, arrived on Tuesday accompanied by Mrs. Minor.

Mr. Champion, vice-president and general manager of the Champion Rivet Company, is expected to arrive in a few days. There will be a small exhibit of boiler, ship and structural rivets.

Fred T. DeLong, vice-president of the Chicago Railway Equipment Company, arrived yesterday on the Pennsylvania special. He will be in charge of the company's forces during the convention.

Charles Ridell, of the Baldwin Locomotive Works, came on the M. C. B. and M. M. special. Mrs. Ridell and two children accompanied him as far as Haddonfield, N. J., where the children will spend the summer.

J. Will Johnson, special representative of the Pyle National Electric Headlight Company, came early, arriving from Chicago at 11.15 o'clock p.m. Monday, and has since been renewing old acquaintances and making new ones.

F. C. Dunham, special sales agent, and E. D. Hillman, mechanical engineer, of the U. S. Metal & Manufacturing Company, New York, arrived on Monday. They came early in order to look after the many interests of their company.

Dr. Griffin, president of the Wheel Truing Brake Shoe Company, Detroit, Mich., may be seen carrying a broad smile and his "greatest camera on earth." He says that there is nothing too swift for the lens.

Do you know Mr. Riley, they speak of so highly?
His wad is so big he could buy a hotel;
He won't look at nickels but hauls in the sheckels.
O, bless your soul! Riley? I know him quite well.

W. H. S. Bateman, formerly general traveling sales agent for the Lukens Iron & Steel Company, is in attendance at the conventions as representative of two firms, the Parkesburg Iron Company, Philadelphia, and the Champion Rivet Company, Cleveland Ohio.

The Western Union Telegraph Company has an office in the Marlborough-Blenheim and the Postal Telegraph office is located at Michigan and Pacific avenues. Messengers will be furnished upon telephone request from booths upon the pier.

C. M. Baker, of the Murphy Varnish Company, Newark, N. J., and Chicago, will not be accompanied by his wife this year. The particular attraction in Chicago for Mrs. Baker was a new Woods electric brougham, a present from her husband.

Henry J. Bellman, with Mrs. and Miss Bellman, arrived at the Traymore Tuesday morning. It was necessary for him to leave for Buffalo immediately, but he left a stuffed freight car on the sands to remind all who run that Baeder, Adamson & Co. is here.

E. A. Drake, of Drake & Wiers, Cleveland, Ohio, is on the ground in the interest of their asphalt car roofing, for which no exhibit seems necessary. He says that the 300 cars for the Panama Canal, recently ordered, will be fitted with roofing of their make.

Following the practice of recent years, the membership of the various committees of the Railway Supply Manufacturers' Association was determined upon in advance of the conventions, and the names of the men who will serve the present year are as follows:

The annual meeting of the Railway Supply Manufacturers' Association will be held in the Greek Temple near the ocean end of the pier on Saturday, June 20, at 11 a.m. Time and place of district meetings for the election of members of the executive committee will be announced later.

A great convenience to exhibitors is the ample provision of telephones. A Bell telephone has been placed between each two exhibit booths on the pier and these are available for free use in local service by exhibitors. For use in long-distance calls they are equipped with coin devices.

Mr. and Mrs. W. H. Miner decided at the last moment to change their route and visit New York for a few hours on the way to Atlantic City. They had engaged accommodations on the Pennsylvania special and their presence was missed by their many friends on that train.

Jay Gardner, of Chicago, and Jay Keegan, of Grand Rapids, Mich., started for the conventions in an automobile. They have not arrived—yet. At last accounts Keegan had been on the car for nine days while Gardner had been on it for two days and under it for seven days.

H. J. Small, general superintendent of motive power of the Southern Pacific, accompanied by Miss Small, reached Atlantic City yesterday. From ocean to ocean is a long journey to attend the conventions. Mr. Small, greatly to his regret, has been able to attend the conventions of the past four years.

Thomas M. Gallagher, vice-president of the Scullin-Gallagher Steel Company, St. Louis, and who ranks as one of the veteran convention attendants, having missed but few since the beginning, was distinguished this year by receiving the first badge issued by the enrollment committee. Mrs. Gallagher is with him.

F. S. Bamford, city passenger agent Pennsylvania lines, Chicago, is entitled to lots of credit for his management of the Pennsylvania M. C. B. special train from Chicago to the conventions. When Atlantic City was reached the passengers gathered together and gave Mr. Bamford a vote of thanks and three hearty cheers.

E. T. Hendee, of Jos. T. Ryerson & Son, Chicago, was much disturbed when the report of the wrecking of his exhibit on the Pennsylvania railroad reached him. He promptly ascertained by telegraph the extent of the damage and ordered from Chicago duplicate machine tools to take the place of those damaged in the wreck.

Frederick Ingalls, of the American Locomotive Equipment Company, Chicago, arrived for the conventions yesterday. Mr. Ingalls has not attended the M. C. B. and M. M. conventions for several years. As president of the Buda Foundry & Manufacturing Company, Chicago, Mr. Ingalls attended the maintenance of way conventions regularly.

The executive committee of The Railway Supply Manufacturers' Association is entitled to a great deal of credit for its enterprise in bringing out a preliminary list covering hotel reservations in advance of its regular list of attendance. Of course, such a list is necessarily incomplete, and some of the information therein will be changed, but so far as it goes it has been found to be of much use.

At the reception this evening at the Marlborough-Blenheim Beale's orchestra will play concert music in the ballroom until 10.30, after which time dance music will be given. Alternating with the selections given by the band, a mandolin and guitar quintet will play outside on the plaza, provided the weather is such as to permit. Following the reception Mary Jordan FitzGibbon will sing one number.

C. B. Moore, the genial sales manager of the American Locomotive Equipment Company, Chicago, was much in evidence on the Pennsylvania M. C. B. and M. M. special train from the West. He distributed through the train long, snaky toy balloons which floated about through the cars, much to the amusement of the passengers. In-door base ball games were played in each car.

C. B. Conger, well-known to several railroad mechanical associations as an active and efficient member, to the entire railroad mechanical public as an authority on air brake and injector practice and to a multitude of miscellaneous friends as a mighty good fellow, has recently taken a position in the injector department of William Sellers & Co., Philadelphia. When not on the road he makes his home at Grand Rapids, Mich.

Hon. James S. Harlan, of the interstate commerce commission, arrived at Atlantic City on Monday, and is at the Dennis. Mr. Harlan did not come for the specific purpose of attending the conventions. He brought from Washington a large pile of official papers, and will divide his time between rest and work. It is probable, however, that he will look in at the conventions, and he made an inspection tour of the exhibits on Monday afternoon.

In accordance with previous custom, the "Transportation" committee has provided roller chairs for the free use of all members and guests of the associations wearing the official badge. This service will be available between 9 a.m. and 6 p.m. and from June 17 to June 24 inclusive from stations at the main entrance to Young's Million Dollar Pier and the Boardwalk opposite Haddon Hall. Private chairs may be secured at special rates through the transportation committee.

Really, there were 12 cars on the Pennsylvania M. C. B. and M. M. special which arrived yesterday afternoon from the west. Eleven coaches and one Carr, given name George, vice-president of the Dearborn Drug & Chemical Works, Chicago. Robert F. Carr, president of the company, will not attend the convention this year. A little girl presented herself at the Carr home in Chicago not so very long ago and Mr. and Mrs. Carr will remain home and entertain her.

The bubbling, sparkling, irrepressible William V. Dee, who arrived on the scene yesterday morning, appears this year for the first time in another capacity than as general, all-around, go-everywhere-and-get-there-all-the-time hustler for the Daily. If Will keeps up the gait to which he has for some years been accustomed, every master car builder will go hence with an Anti-Pluvius skylight in his head piece and every supply man will return with a Lovell sash-operating device to keep his eyes open. He needs neither himself.

Those of the attendants upon the conventions who venture to trust themselves to the tender mercies of the Atlantic will find their badges of material use at Reed's baths, on the Boardwalk, under Hotel Dennis, and at the Brighton Casino, which latter place is provided with an indoor swimming pool. Rates of 25 cents per person have been at the former place and of 50 cents at the latter, each including suits. At the Brighton Casino free admission will be granted to wearers of official badges.

J. C. McQuiston, manager of the publicity department of the Westinghouse Companies, has in the booth of these companies a big supply and varied assortment of the handsomely-printed, well-edited advertising literature which he is famous for getting out. Ten or fifteen representatives of the Westinghouse Companies will be at the conventions. Most of them will be from New York, Philadelphia and the East, but Pittsburg, Chicago and other Western cities will contribute their fair quotas to the delegation.

Percy Wheeler and E. Squires, of the Metropolitan Carriage & Wagon Company, Ltd. (England), and Thomas Knowles, a steel expert from Great Britain, will spend Thursday, Friday and Saturday of this week with exhibitors, as the guest of William R. Webster. They will make the office of the Railroad Age Gazette headquarters when on the Pier. Their object in coming at this time is to perfect a working arrangement with some American car building company, and to look into American appliances that may be adopted to foreign practice.

The booth of the Daily Railroad Age Gazette is at the northeast corner of Young's Million Dollar Pier, near the entrance. In consequence of the recent consolidation of The Railway Age and the Railroad Gazette, and of their business and editorial staffs, visitors to the booth will see among those working on the Daily several new faces. It will be the endeavor this year, as in the past, to get all news pertaining to the conventions; and anybody who comes into the Railroad Age Gazette booth with a piece of news will have a hard time getting out until he has been separated from it.

One of the important features at the conventions this year is a postoffice, which is situated next to the registration counter on the east side of Young's Million Dollar Pier. This postoffice has been opened for the convenience of persons attending the conventions. They will find that they will get their mail more promptly if they have it sent there than if they have it sent to the hotels. Persons wishing to receive mail at the convention postoffice should give instructions to

this effect at the Atlantic City postoffice and should request their correspondents to address them in care of "Young's Million Dollar Pier." The facilities provided will be ample to handle expeditiously all the mail that comes.

The Country Club of Atlantic City extends the privilege of its club house to all members and guests during their stay, and admission to the grounds will be by official badge. It also extends the privilege of the links for a charge of one dollar per day, and tickets may be obtained from the steward at the club. The club is located at Northfield, and may be reached by the Shore Fast Line electric cars, leaving from Boardwalk and Virginia Avenue on the hour and half hour, returning leave Northfield station at twenty and fifty minutes past the hour, also by the Atlantic City & Suburban Traction Company's cars, leaving from Florida Avenue and Boardwalk at 15 and 45 minutes past the hour, returning leave Northfield 10 and 40 minutes past the hour. Running time about twenty minutes.

This is the first year that Earl G. Smith, the present secretary of the Railway Supply Manufacturers' Association has had charge, under the supervision of the executive and exhibit committees, of the installation of exhibits. This is difficult and trying work; and it is the unanimous verdict that he has "made good." Mr. Smith became secretary of the association last October. He was formerly a member of the editorial staff of The Railway Age. After leaving the Age, in February, 1907, he went to Alaska where he spent eight months "roughing it" for his health. He has had use, during the past few weeks, of the increased strength and energy that he got during his stay in Alaska; and he has employed it to good purpose. He has proved a genial, hard-working and capable officer of the association.

"Artie" and "Earl," as the two white whales in the tank at the further end of Marine Hall on the pier have recently been named in honor of the president and secretary of the Railway Supply Manufacturers' Association—presumably on account of their untiring activity and the fact that they take breath and other means of support on the fly—are one of the outside incidental features of the exhibit on the pier, which, in reportorial language are "attracting much attention from delegates and guests." Judging also from a few moments' inspection "a great time was had." These enlarged specimens of white cat-fish—with apparently no eyes and no visible method of breathing except a blow-off cock located where the alternately good and horrid little girl's curl hung—in the middle of the forehead—are considered by the non-technical mind to be of especial interest to all users of compressed air. The proportions existing between the volume of air which would apparently be required to support life in so large a body and the insignificant volume of exhaust suggests a very high degree of efficiency in operation.

Atlantic City, to most of the people who come here to attend the conventions, or to amuse themselves while others are attending them, is a long row of hotels on one side, the Atlantic ocean on the other side, and the boardwalk running down the middle. As a matter of fact, back of the hotel district, a few blocks removed from the boardwalk, there is a good-sized town whose inhabitants eat, breathe, sleep and run grocery stores very much like the people of other towns. The impression of visitors who don't think much about the matter doubtless is that a summer resort town is essentially different from other towns. This is the case only superficially. The people of watering places very seldom drink much of the water that made Excelsior Springs and West Baden famous. The farming population around the lakes in Wisconsin doesn't spend all its time boating and fishing. Likewise, the great majority of the people of Atlantic City doesn't spend much more or less valuable time looking at exhibits or galloping on the beach in bathing suits. The residents here have to make their livings just like others, and, anyway, they are so used to the ocean, the boardwalk and the million dollar pier that they don't pay much attention to them. Visitors who wish to carry away recollections of the real Atlantic City should hunt it out in regions some distance west of the boardwalk.

The entertainment committee has shown its appreciation of its duties and added materially to its usefulness by subdividing itself into sub-committees, each in charge of particular duties. The sub-committees are as follows:

Music—Messrs. Self, De Rosset, Old, Hayes, Johnson.

Reception—Messrs. Berry, Walker, Johnson, Hawley, Walsh, Welles.

M. C. B. Ball—Messrs. Walker, Berry, De Rosset, Hawley, Chisholm, Brazier.

M. M. Ball—Messrs. Johnson, Self, Langston, Stayman, Mitchell, Younglove.

Vaudeville—Messrs. Hawley, Oesterreich, Seabury.

Baseball—Messrs. Midgley, Brazier, Connors, Hibbard, Walsh.

Door—Messrs. Brazier, Midgley, Hayes, Hibbard, Welles.

Informal Dance—Messrs. Hayes, Forsyth, Seabury, Oesterreich, Chisholm.

Introduction—Messrs. Walsh, Garrett, Mitchell, Connors, Old.

Ushers—Messrs. Garrett, Stayman, Langston, Younglove, Forsyth.

Following the suggestion of the superintendent of motive power of a prominent road, it has been decided to vary the usual programme of the annual ball game and afford members an opportunity to obtain a little physical exercise as a relief from the close mental strain of the Master Car Builders' convention. Accordingly a railroad base ball team has been organized to meet the Supply Men's Association team on Saturday afternoon at Inlet Park. Captain and Manager George W. Wildin is reported to have unearthed some exceptional talent, but is reticent about furnishing the public with the names of the men he has signed. It is rumored that an unusually dextrous pitcher has been discovered, and this report has led the supply men to the assiduous practice of batting—not knocking—whenever they can get a moment off from attendance upon their respective exhibits. It is probable that the line-up of the two teams will be sufficiently settled for announcement on Friday. Captain Midgley of the Supply Men's Association team is quoted as saying that he expects to win, but counts on a close game.

Railroad Certificates.

Holders of railroad certificates entitling them to a reduced return rate are requested to deposit them with Earl G. Smith, secretary Railway Supply Manufacturers' Association, whose office is on the balcony af the ocean end of the entrance hall of the pier.

Committee on Grouches.

Notice has been given that the committee of arrangements will gladly undertake to adjust complaints of any kind upon notice thereof. The committee is as follows:

R. T. Walbank, chairman; William McIntosh, George N. Dow.

Officers of the Railway Supply Manufacturers' Association.

Under the organization perfected two years ago the various affairs connected with the annual conventions of the Master Car Builders' and Master Mechanics' associations are in the hands of the Railway Supply Manufacturers' Association and various committees named by it. The present officers of the association are as follows:

R. T. Walbank, Glidden Varnish Company, Chicago, Ill., president; F. L. DeArmond, Protectus Company, Philadelphia,

Pa., vice-president; Geo. N. Riley, National Tube Company, Pittsburg, Pa., treasurer; Earl G. Smith, secretary.

Executive committee members: The president, vice-president, treasurer and L. O. Cameron, Pressed Steel Car Company, Atlanta, Ga.; Alex. Turner, Galena-Signal Oil Company, Buffalo, N. Y.; W. H. Miner, W. H. Miner Company, Chicago, Ill.; A. L. Whipple, Forsyth Brothers Company, New York.; A. G. Hollingshead, Ralston Steel Car Company, Columbus, O.; Frank A. Morrison, Mason Regulator Company, Boston, Mass.; Thos. Aldcorn, Chicago Pneumatic Tool Company, New York; R. H. Weatherly, Scullin-Gallagher Iron and Steel Company, St. Louis, Mo.; Geo. A. Cooper, Frost Railway Supply Company, Detroit, Mich.

Entertainment Committee.

Charles P. Storrs, Storrs Mica Company, General Chairman; Herbert Self, Crandall Packing Company, Chairman Music Committee; E. H. Walker, Standard Coupler Company, Chairman M. C. B. Ball Committee; J. Will Johnson, Pyle National Electric Headlight Company, Chairman M. M. Ball Committee; S. W. Midgley, Curtain Supply Company, Chairman Baseball Committee; Bertram Berry, Heywood Bros. & Wakefield Company, Chairman Reception Committee; Cornell S. Hawley, Consolidated Car Heating Company, Chairman Vaudeville Committee; F. O. Brazier, Murphy Varnish Company, Chairman Door Committee; Ross F. Hayes, Curtain Supply Company, Chairman Informal Dance Committee; C. M. Garrett, Farlow Draft Gear Company, Chairman Ushers' Committee; W. J. Walsh, Galena-Signal Oil Company, Chairman Introduction Committee; A. G. Langston, Jenkins Brothers; J. L. Connors, Ralston Steel Car Company; George H. Forsyth, Forsyth Brothers Company; H. E. Oesterreich, Wendell & MacDuffie; John M. Stayman, Gold Car Heating and Lighting Company; Philip J. Mitchell, Philip J. Justice & Co.; Leonard J. Hibbard, American Brake Shoe & Foundry Company; J. S. Seabury, Massachusetts Mohair Plush Company; T. C. DeRosset, T. H. Symington Company; Edward P. Welles, Chas. H. Besley & Co.; J. C. Younglove, H. W. Johns-Manville Company; R. S. Chisolm, Railroad Age Gazette; Clayton W. Old, American Blower Company.

The other convention committees are:

Transportation Committee.

L. R. Phillips, National Tube Company, Chairman; John D. Ristine, Lowe Bros. Company; Harry C. Quest, John Lucas Company; Joseph H. Kuhns, Republic Rubber Company; L. C. Brown, Ralston Steel Car Company; W. J. Caton, American Lumber & Manufacturing Company; Frederick A. Coolidge, General Compressed Air & Vacuum Machinery Company; Edwin F. Leigh, Chicago Railway Equipment Company; W. E. Cade, Jr.

Enrollment Committee.

M. B. McNulty, Pratt & Lambert Varnish Company, Chairman; Charles D. Lyle, Manning, Maxwell & Moore; Kelly R. Johnston, National Malleable Castings Company; W. W. Rosser, T. H. Symington Company; Ernest H. Bennett, The Official Guide; George A. Post, Jr., Standard Coupler Company; H. N. Turner, St. Louis Surfacer & Pt. Company; Wm. S. Hammond, Jr., Consolidated Car Heating Company; Chas. Dexter Allen, Travelers' Railway Guide, Oscar F. Ostby, Commercial Acetylene Company.

ENTERTAINMENTS.

The principal events and features of entertainment provided during the two weeks of the convention are as follows:

Wednesday, June 17.

9:30 A. M.—March of Master Car Builders' Association from Marlborough-Blenheim Hotel to Greek Temple, New Pier. (Band.)

11:00 A. M.—Band concert—Entrance Hall, New Pier.

3:30 P. M.—Band concert—Entrance Hall, New Pier.

9:00 P. M.—Joint reception—By the Officers of the M. C. B. A. and A. R. R. M. M. A. and their wives in the Blenheim Exchange, Marlborough-Blenheim Hotel. (Orchestra.)

10:30 P. M.—Dancing—Ball Room Marlborough-Blenheim Hotel. (Orchestra.)

Thursday, June 18.

11:00 A. M.—Band concert—Entrance Hall, New Pier.

3:30 P. M.—Band concert—Entrance Hall, New Pier.

9:00 P. M.—Forty-second Annual Ball of the Master Car Builders' Association—Entrance Hall, New Pier.

Friday, June 19.

11:00 A. M.—Band concert—Entrance Hall, New Pier.

3:30 P. M.—Band concert—Entrance Hall, New Pier.

9:00 P. M.—Concert—Victor Herbert Orchestra (50 pieces). Mr. Victor Herbert, conducting; Mary Jordan FitzGibbon, contralto—Entrance Hall, New Pier.

10:30 P. M.—Informal dancing—Ball Room, Marlborough-Blenheim Hotel. (Orchestra.)

Saturday, June 20.

11:00 A. M.—Annual meeting Railway Supply Manufacturers' Association—Greek Temple, New Pier.

11:00 A. M.—Band concert—Entrance Hall, New Pier.

2:00 P. M.—Base ball parade to special trolleys—(See announcement in Daily Railroad Age Gazette).

3:00 P. M.—Base ball game—Master Mechanics' and Master Car Builders' vs. Supply Men—Pennsylvania Railroad Co's. Inlet Park Base Ball Grounds.

9:00 P. M.—Entertainment—Ball Room, Marlborough-Blenheim Hotel—Miss Lucine Finch, unpublished Negro Stories and Songs—Mr. Charles Safford, musical monologues.

10:30 to 12:00 P. M.—Informal dancing—Ball Room, Marlborough-Blenheim Hotel. (Orchestra.)

Sunday, June 21.

11:00 A. M. and 9 P. M.—Special program—By Marlborough-Blenheim Orchestra, Mary Jordan FitzGibbon, contralto.

Morning, Afternoon and Evening—Sacred concerts—Marco Vesella's Band—Young's New Million Dollar Pier.

Monday, June 22.

9:00 a. m.—March of Master Mechanics' Association from Marlborough-Blenheim Hotel to Greek Temple, New Pier. (Band.)

11:00 a. m.—Band concert—Entrance Hall, New Pier.

3:30 p. m.—Band concert—Entrance Hall, New Pier.

8:45 p. m.—Vaudeville—New Apollo Theatre, Boardwalk and New York avenue. Special program of Keith & Proctor, Headline attractions (Supply Men's Chorus in gallery).

10:30 p. m.—Informal dancing—Ball room, Marlborough-Blenheim Hotel. (Orchestra.)

Tuesday, June 23.

11:00 a. m.—Band concert—Entrance Hall, New Pier. (Old Songs by the Old Crowd.)

3:30 p. m.—Band concert—Entrance Hall, New Pier.

9:30 p. m.—Forty-first Annual Ball of the American Railway Master Mechanics' Association—Entrance Hall, New Pier. (Orchestra.)

Wednesday, June 24.

11:00 a. m.—Band concert—Entrance Hall, New Pier.

3:30 p. m.—Band concert—Entrance Hall, New Pier.

8:00 p. m.—Band concert—Entrance Hall, New Pier.

Vesella and his Italian Band, Marco Vesella, conductor, by the courtesy of Captain John Young of Young's New Million Dollar Pier, will give concerts daily in the Entrance Hall, at 11 a. m., 3.30 p. m. and 8 p. m., except that evening concerts will be omitted on Thursday, Friday and Tuesday evenings. This band will furnish music for the march to the meeting hall on the opening day of each convention.

Beale's Band and Orchestra of Philadelphia, Edmund D. Beale, director, will furnish music for dancing at each ball and at the informal dances.

THE CONSTANT SPEED DRIVE MILLING MACHINE.

Since the first milling machine with its very limited range and capacity, many improvements have been made which have placed it in the front rank of modern commercial machines. Very few of these improvements, however, have had the importance or have enlarged its position in the manufacturing world to so great an extent as the change from a cone to a single pulley drive.

It had been realized for many years that the cone drive was limited and that certain definite ends which were often desired could not be attained. And coupled with the fact that the growing use of high speed steels required stiffer and stronger machines with more power, it became imperative that a machine of other design than the cone be constructed to meet modern requirements. The call of commercial milling today is for machines with greater power and rigidity than any of earlier design and which can turn out a large quantity of work at high speed and fast feeds.

Anticipating these needs and realizing that some means must be provided whereby the objections to the cone drive could be overcome, the Brown & Sharpe Manufacturing Company designed, constructed and had running in its shops as early as 1899 a new type of milling machine known as the constant speed drive. The fundamental principle underlying this type of machine is a single pulley or motor running at a constant speed, the variations of spindle speed being obtained by means of gearing inside the frame. By this method certain features develop that are distinctly advantageous in modern milling machine practice.

The line of machines exhibited by this company shows an

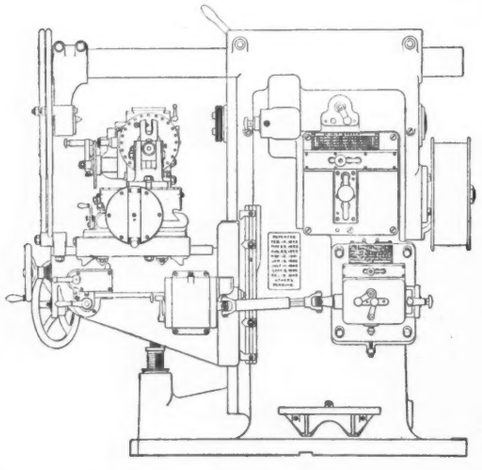


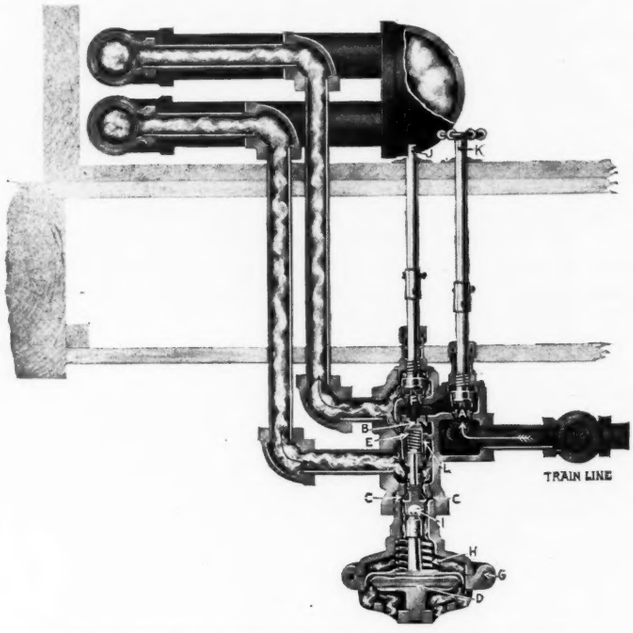
Diagram of Constant Speed Drive Milling Machine.

unusual attention to details in construction to give great rigidity and to insure greatest economical production within the capacity of any given machine and the exhibit is in charge of expert mechanics, who are entirely familiar with milling machine practice.

Charles P. Storrs of the Storrs Mica Company claims to be indignant over the fact that his company was not assigned exhibit space in "Newspaper Row" as it published for the past year a periodical calendar which is seen on the walls of many railroad mechanical offices. This calendar shows the dates of railroad club and association meetings and conventions, and a mailing list for it was started at last year's convention. Mr. Storrs' disappointment is somewhat softened by the thought that his space, as located, is far removed from the noise and confusion of the crowd of supply men making application for increased advertising space that is so apt to be found around the space occupied by the publications.

CONSOLIDATED CAR-HEATING COMPANY'S VAPOR SYSTEM OF HEATING FOR CARS.

The vapor system differs from the well known direct steam heating system in that there is no pressure at any time in the radiating pipes in the car. In the engraving, Figure 1, a section of one side of the system is shown; there is one such arrangement on each side of the car. Figure 1 shows the system operating as a vapor system and Figure 2 shows it operating as a direct steam system. The inlet

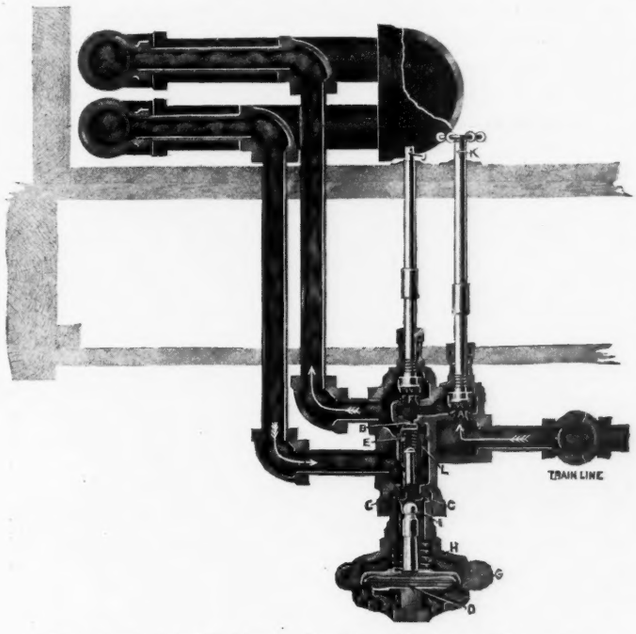


The Consolidated Vapor Heating System—Figure 1.

port of the trap is slightly above the train line level to insure proper drainage of the short spur connection. The presence of steam in the pipes and trap is indicated by different shades in the illustrations, the dark shade representing the train line pressure and the lighter shade the vapor or atmospheric pressure steam. When the inlet valve A is opened, the train line pressure steam is permitted to flow as far as the automatic valve B. It here passes through the port, this being open, as the diaphragm is contracted when there is no steam in the system, and passes to the car piping, returning as indicated by arrows to the lower connection, whence it flows direct to the atmosphere, passing over the diaphragm. The valve is adjusted so that the automatic valve B closes when the radiating pipes are full of steam at atmospheric pressure, and it will maintain this condition and allow virtually a constant flow of steam at all times. This system does not operate periodically only, as is the case with direct steam traps. The valve seat C does not close in vapor operation of the trap, as when the valve B is closed the valve C is 1-32 inch away from its seat, thus allowing the steam to have a free flow to the atmosphere.

The valve C has a double use, as follows: (1) If the gasket on the valve B should become damaged, steam would blow direct to the atmosphere, were it not for this second valve C, which will close in this event, because of the increased temperature in the steam, which would then blow on the diaphragm D, expanding the diaphragm and compressing the spring E, thus allowing the valve C to seat. (2) The valve C is used in connection with the by-pass valve F, in order to change the system to a direct steam system, in case of a period of extreme weather or for any reason where more heat is desired than can be obtained with the straight vapor system. Upon opening the by-pass valve F, train line pressure steam flows around through the system and is retained

at the valve C in exactly the same manner as is the common practice on all direct steam systems. This feature of the by-pass is a very desirable one as it provides a means for meeting all kinds of temperature conditions, at the same time providing a vapor system for use in normal weather conditions. The inlet valve of the system is located in the trap, as shown,



The Consolidated Vapor Heating System—Figure 2.

and the car piping is of the simplest, and only four holes need to be cut in the car floor in order to install the system. The trap does away with all separate inlet valves, graduating valves and pressure regulating valves with their attendant piping.

A LEADING INDUSTRY.

The Philip Carey Manufacturing Company of Lockland, O., was organized over 30 years ago, and while a very small concern at that time, the founder realized the need of a high-grade composition roofing, and many years were spent in experiment making a thorough investigation of every known composition that could be adapted to a roofing purpose. The result of these efforts was the invention of Carey's magnesia flexible cement roofing, and the cement composition from which it is made.

The qualities claimed for the Carey cement composition are: It is the result of scientific experiments. It contains the highest grade materials and the most durable known, being absolutely free from coal tar or other perishable materials. In the process of manufacture it is thoroughly tempered to resist the extremes of heat or cold, and retain its flexibility, preventing the cracking or breaking of the roofing when exposed to extremes of temperature or other severe conditions. This weather-resisting cement composition is given additional protection by being placed in portable form, that is, imbedded firmly between a woolen felt foundation, and a strong Calcutta burlap, and compressed into a compact, flexible and water-tight sheet, 29 inches wide. The edge of each sheet of roofing is furnished with a patent lap to be cemented down securely over the nail heads and seams, giving the nails protection against rust and insuring a joint that is water-tight and wind-proof.

Round-houses, railroad shops and other buildings of a similar nature where the roof is usually exposed to sulphurous gases, steam, coal soot or smoke, require something more than the ordinary roof to give proper protection for any length of time. Carey's roofing is presented as the most durable and economical roof for this particular class of building. The cement composition is so protected by the construction of the roof that it can not lose its vitality, consequently it remains flexible allowing for all ordinary contraction or expansion without danger of drying out or being affected either by rust or decay.

The Philip Carey Manufacturing Company states that it is the only roofing concern that adheres strictly to the manufacture of one uniform grade and quality of roofing. The good service rendered by Carey's roofing to railroad users in all parts of the country has been the means of building up for the company one of the largest roofing factories in the United States, if not the world. The company's factory occupies an area of 75 acres and is kept in operation day and night the entire year.

This company also manufactures Carey's 85 per cent. Magnesia steam pipe and boiler coverings. The company is a live, progressive concern and has placed itself in a position to handle contracts of every description, and there are few large factories, mills, office buildings or industries throughout the country, for which this company has not furnished either roofing or pipe covering. Branch offices and ware-rooms to the number of 50 or more have been established at convenient points, enabling the company to give contract work personal and prompt attention. The company takes contracts to furnish and apply its product in any part of the United States or Canada, under its own direct supervision and guarantee.

FLAME ARC LAMPS.

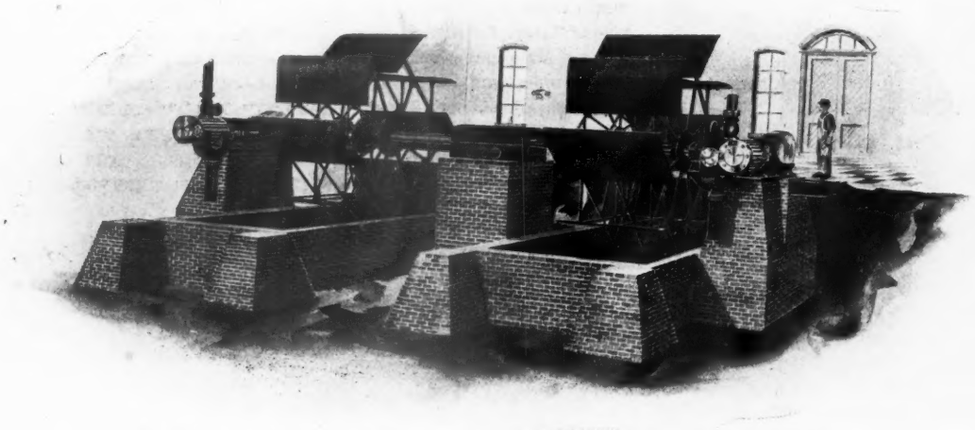
The G. I. flame arc lamp, for either alternating or direct current, illustrated herewith is manufactured by the General Electric Company. This lamp is novel in construction, neat in appearance and readily accessible for trimming and inspection. The standard lamp has a life of 12 hours when operated indoors on 110-volt circuits and a life of from 10 to 11 hours on outdoor circuits of the same voltage. When in normal operation, a current of 12 amperes is required. The mechanism of both the alternating and direct current lamps is identical except that the resistance of the direct current lamp is self-contained while the reactance for the alternating current lamp is mounted externally. The G. I. flame arc lamp has no chain feed or complicated escapement and clock mechanism. It is of the inclined carbon type with nothing below the arc to obstruct the light. Both carbons feed by gravity simultaneously while the regulation of the arc is accomplished by the lateral movement of one carbon with relation to the other. An economizer of refractory material placed just above the point of the carbons aids in steadying the arc. A blow magnet is so situated with relation to the arc that it performs the double function of keeping the arc steadily fan-shaped at the carbon tips, and also totally extinguishes the arc if for any reason it approaches dangerously near to the economizer. The remarkably high efficiency and volume of illumination obtained from this lamp adapts it for lighting foundries, iron mills, railroad stations, railroad yards or other large enclosures where smoke abounds, or for lighting machine shops where it is necessary to hang the lamps a considerable distance from the floor in order to clear travelling cranes and moving machinery.

Arc Lamp.
G. I. Flame

DRAFT FANS AT PLANT OF BIRMINGHAM RAILWAY LIGHT & POWER COMPANY.

The most satisfactory conditions in boiler practice are found when the fuel thrown upon the grate is rapidly disintegrated, and at the same time is supplied with sufficient air brought intimately into contact with it, assuring the uniform combination of the carbon without either unnecessary dilution or the escape of uncombined carbon or the formation of carbon monoxide. Under such conditions the highest initial temperature results and the rest of the plant being properly designed, the efficiency is the maximum. When high initial temperatures are obtained as a consequence of rapid combustion, comparatively thick fires are necessary, and to this end a draft pressure must be carried which makes necessary a very high stack, if a stack be used.

If a low grade of fuel be burned, there is more necessity for thick fires, the difference in calorific value of the fuel calling for the burning of a greater quantity of fuel to produce a given result, and in turn requiring greater intensity of draft.



Draft Fans at Plant of Birmingham Railway Light & Power Company.

With a given stack the intensity of draft varies directly as the intensity of fire, in other words, when the fires are intense the resulting stack draft likewise is at its maximum, whereas with moderate or low fires the draft is more or less sluggish and is dependent entirely upon the fires for its increase, making it difficult to quickly vary the draft to meet sudden and heavy fluctuations in load. New boilers, which have been prepared and fired up long before the call for increased power has come and have been held in readiness, may be thrown into service, but this requires heavy initial outlay in boiler equipment, and a heavy maintenance charge.

The Birmingham (Ala.) Railway, Light & Power Company is designed for an output of 6,000 horsepower, with a load peak calling for 9,000 horsepower. It is equipped with 6,000 horsepower of water tube boilers in double battery of 3,000 horsepower each. Each battery of boilers is connected to the intake of an induced draft fan, each fan having a blast wheel 16 feet in diameter, so designed as to give a draft at the fan inlet in excess of one inch of water. The fans are designed to run at a speed proper for a vacuum effect in excess of two inches water gauge with a consequent increase in the gas volume handled, resulting in an over-rating of the boilers of 50 per cent. with a consequent allowance of 4,500 horsepower for the battery or 9,000 horsepower for the plant, this draft providing for approximately 30 to 36 pounds of coal per square foot of grate surface per hour. It insures 18 pounds of air per pound of coal, and the design provides for the handling of the gases by the fan at 550 degrees F. By this means coal of almost any grade can be burned successfully in the required amount, and at a cost for draft as usually not more than one and never more than two per cent. of the steaming capacity of the plant is required to drive the fans for the maximum requirements, and much less when the plant is operating easily. The output of the plant is dependent on the speed at which the fan is operated and is subject to almost instantaneous increase or decrease at will.

The draft equipment in this plant was designed and furnished by the American Blower Company, of Detroit, Mich., for Ford, Bacon & Davis, consulting engineers, of New York City, and is one of the many similar equipments installed by the American Blower Company in recent years.

THE RYMCO JOURNAL BOX.

The Railway Materials Company of Chicago is exhibiting at space No. 462 a car journal box and lid which embody a number of radical features. The sides of the lid entirely enclose the edges of the box opening, the design being to insure perfect freedom from dirt and dust. If the closing mechanism is broken or damaged the lid remains closed and tight and cannot fall off. The weight of the lid is carried entirely by the box itself along its full width and does not hang from rivets, bolts or pins. It is closed by a spring at the bottom of the lid and not at the top and is kept closed in a manner which is unique in that the lower part of the box is clamped against the face of the lid, not by a long overhanging spring deriving its pressure from the top of the box, but by a short levered lug right at the point where strength is most needed.

As will be seen from the illustrations the lid slides up and down, being guided in its movement by the over-lapping sides of the lid. The box is cast with a lip surrounding the four sides of the opening, and three of the over-lapping sides of the lid are turned in to engage the back of the lips on the box, thus permitting a vertical sliding movement only. The fourth, or bottom side of the box opening, is closed by means of a hinged flap or lug on the bottom of the lid which is actuated by a coil spring. By this arrangement the natural tendency is to keep the lid closed at all times. The hinged lug and spring are protected by a housing which is cast over them. Even should this lug be damaged the efficiency of the lid is not impaired as the box still can be closed or opened as before and even under these conditions it cannot fall off. The folded over edges at the sides insure a tight fit against dirt at all times and also effectually prevent the wedging out of the lid by snow or sand.

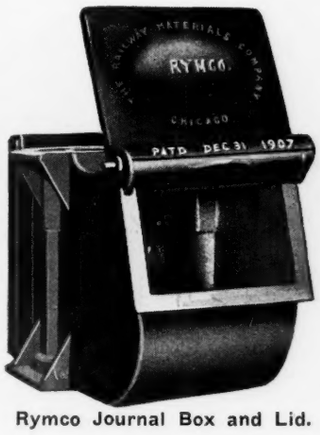
Rymco Journal Box.

To open the box the operator raises the hinged lug which then disengages from the lip on the lower edge of the box face. The lid is then slid up to its full opening when it comes

against a stop which prevents further movement. If it is desired, the lid can be made so that it can be removed from the box in a moment and without removing a bolt, rivet or pin, being merely pulled forward from its natural upward slide when at the extreme opening. It cannot, of itself, disengage and fall off when made in this manner. The lid may also be made so that it cannot be removed entirely without bending back a projecting lug on the inside which is a part of the stop, but this in no way interferes with opening the lid for brass renewal or re-packing. The box and lid are furnished in malleable iron or can be supplied as a cast iron box with a malleable lid as desired.

FAVORITE REVERSIBLE RATCHET WRENCH.

Greene, Tweed & Co., 109 Duane street, New York, are now offering to the trade the Favorite reversible ratchet wrench, the different forms of which are here illustrated. Figure 1 represents the wrench as made in sizes Nos. 1, 2, 2½ and 3, the length of the handle being 15 inches in the No. 1 size, and 28 inches each in the others. The handle is in one piece and without joints to weaken it. The reversing attachment is near the head, and so guarded as to prevent likelihood of injury. The heads are made to accommodate square nuts on one end and hexagon nuts on the other, or hexagon nuts on both ends, and so constructed as to have the opening clear through the head, thus allowing the bolt to go through it and allowing a jam nut to be seated if desired. The little machine work on this wrench has greatly reduced its cost.



Rymco Journal Box and Lid.

The wrench with open heads is particularly serviceable for engine builders, machine shops, bridge builders, contractors, and wherever heavy work is handled, and many nuts of uniform size are encountered. Some of the marked advantages of this construction are that the wrench entirely compasses the nut and prevents slipping and marring, this being especially important where new work is being assembled, or where nuts are being removed from cylinders to be later replaced. It is also very serviceable in limited spaces, as a slight travel of the handle will catch one tooth of the ratchet and cause it to work. The movement can be reversed instantaneously by throwing over the lever. In seating or removing nuts the motion is continuous until the operation is completed, thus greatly economizing time. The No. 1 size takes three different heads, the No. 2 can be furnished with five heads, and the Nos. 2½ and 3 three heads each, the openings of all in the regular sizes being designed to fit standardized nuts. One head accompanies each head regularly, but any or all of the various heads can be furnished according to a schedule of sizes giving detailed information and prices.

Figure 1.—Favorite Reversible Ratchet Wrench with Head.

Figure 2 illustrates the No. 0 wrench completely mounted on a well made oak wrench board suitable for hanging in an engine room, or the handle with any of the parts can be furnished, according to specifications. This wrench is finished either in japan or nickel plate. The handle is 15 inches long and the sockets will fit U. S. standard square nuts for ⅜, 7-16, ½, ⅝ and ¾-inch bolts, another set fitting hexagon nuts for the same sizes of bolts. In the complete set is an 8-inch extension socket and a 7-inch drill head for square shank drills only.

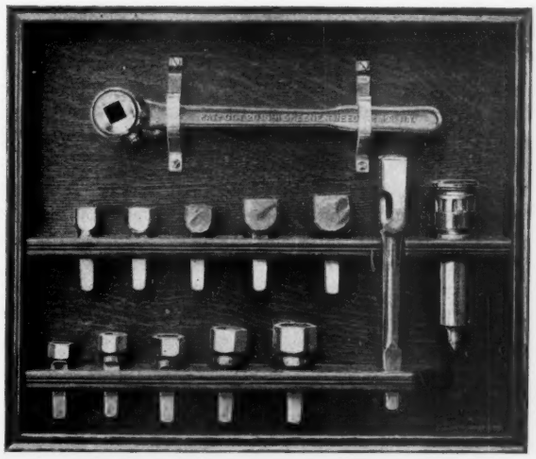
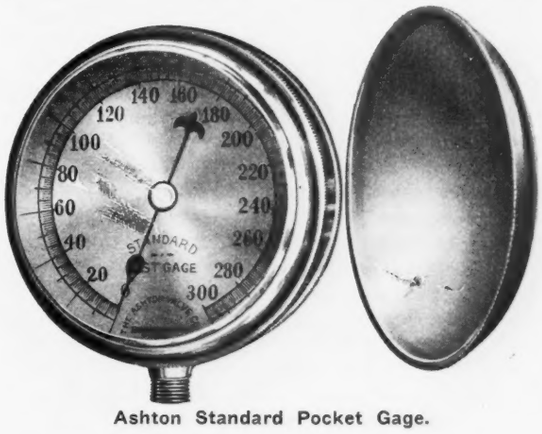


Figure 2.—No. 0 Favorite Reversible Ratchet Wrench and Attachments.

ASHTON STANDARD POCKET GAGE.

The Ashton pocket test gage is constructed so that it can be carried in the pocket or hand bag without danger of injury, being made with a bevel plate glass front and fitted with a cover to insure perfect protection, and is much appreciated and largely used by air brake inspectors, boiler inspectors, master mechanics, chief engineers, etc. The gage is made in the 3-inch dial size, graduated for any pressure up to and including 500 pounds, with full nickel plate, and weighs, complete with cover, about one pound. The manufacturer is the Ashton Valve Company of Boston.



Ashton Standard Pocket Gage.

The U. S. Metal & Manufacturing Company's exhibition car on Mississippi avenue presents a very neat appearance in its brand new coat of St. Louis Surfacer paint. An operator demonstrates the working of the Dunham hopper doors of which there are five types on the car. The Feasible drop brake Staff is also shown and every bolt throughout the car is equipped with a Columbia lock nut.

THE BARNEY & SMITH COMPANY.

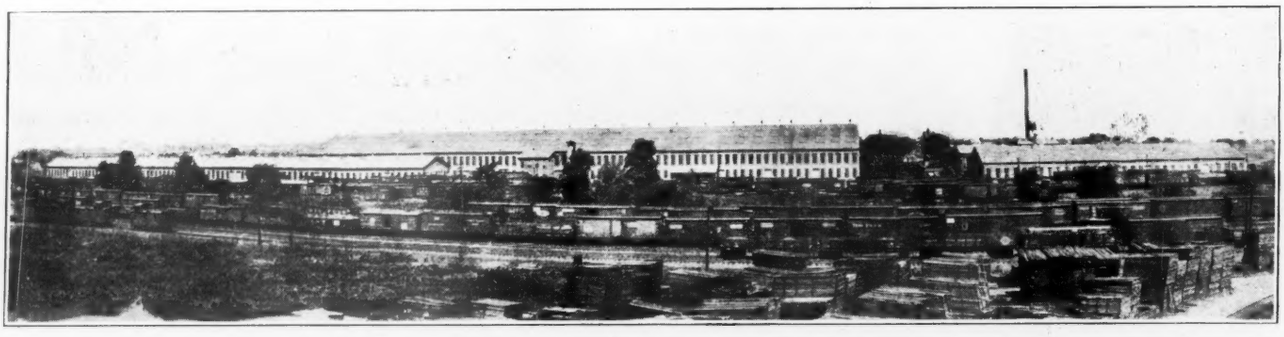
Eliam E. Barney, 60 years ago, founded at Dayton, Ohio, what has come to be the Barney & Smith Car Company, building wiser than any one at that time knew. He built only the foundation, but it was a foundation that called for the magnificent structure that had developed.

The growth of this enterprise was forcibly brought out at the "Quarter Century Dinner" given by the company to all employes who had served 25 years or more; 178 men were present under the invitation, some of them having served for 50 years or more, and the average length of service of the entire number was more than 32 years.

Among those present were some of the most skilled mechanics ever employed in the city. Many of these have sons in the plant working at the trades of their fathers, and all of them are fixtures as nearly as it is possible for employes to be fixtures. The spirit of fraternalism displayed between the officers of the company and these old employes showed why the men had remained with one concern for so long a time, and the fact that the men have remained for so long a period gives evidence of why, when conditions are everywhere changing, this institution is able to maintain its record and to continue its hold upon the trade. Of these men 93 per cent own their own homes, and taking the entire force, 3,500 men, of the Barney & Smith Car Company, it is believed that a larger portion of them own their own homes than is the case in any other factory in the country.

The plant of the company is still located upon the tract upon which it was founded. It has given distinction to a whole section of the city, and it is a badge of honor to be known as an employe of the "Car Works."

The policy of the company has always been to improve the plant at every opportunity, and the late depression has afforded an opportunity for placing the plant in the most perfect running order. When business again picks up and the Barney & Smith Company again desires a full force of the best mechanics, it will be necessary only to blow its whistles, and the force will reassemble, every man knowing what to do because he has done it before, because the men are not of the class that "take to the road" when temporarily out of work.



New Steel Freight Car Plant of Barney & Smith Company.

THE OTLEY PRODUCTS.

The Otley Manufacturing Company, 858-859 North Winchester avenue, Chicago, manufactures a number of specialties for use in connection with the locomotive, all of which have met with a very hearty reception on the part of railroad mechanical men. These specialties include a line of graphite lubricants, of which the Silver Flake is made in 18 different grades and the A in nine grades. Eureka "Gloss-Kote" lacquer is a preparation for boiler fronts, smoke stacks and steel cars and is a thin graphite lacquer paint which is applied by means of a patent sheep's wool daubing mit which polishes as the coating is applied. Eureka steam or iron joint cement for joints on locomotive tanks and steam pipes around front end doors and rings, for embedding boilers to cylinder saddles, fitting expansion pads to fireboxes, etc., is a combination iron paint, paste or putty according to the degree in which it is diluted; the desired consistency is obtained by mixing with boiled linseed oil. This is especially recommended for the preservation of interior of tender tanks from rust and for making tight joints in and about the front ends of locomotives and mud rings of fireboxes, etc. This is a mineral product which is not affected by heat. Eureka heat proof iron enamel for boiler fronts, smoke stacks and braces is another specialty which has been well received.

ATHA STEEL CASTING COMPANY.

The Atha Steel Casting Company, of Newark, N. J., which in 1906 succeeded to the business of Benjamin Atha & Co., established in 1864, is believed to be the first company successfully to produce commercial open hearth steel castings in the United States. The company operates one of the largest independent steel foundries in the country, having three 30-ton open hearth furnaces and three 1½-gross ton top-blown Bessemer converters (similar to those used in the Tropenas process), with a total capacity of about 3,000 tons of steel castings per month.

The Atha Company makes a specialty of furnishing to railroads and car builders cast steel body and truck bolsters, and has been remarkably successful in this line. It also makes castings for all classes of locomotives and cars. Another line along which the business has been developed is the production of electrical steel castings, such as railway motor frames, caps, generator castings, etc., and it is claimed that its output of steel castings of this character exceeds that of all the other independent foundries in the country combined.

Since beginning the manufacture of genuine manganese steel castings some years ago, the company has taken up the manufacture of electric railway motor gears and pinions of manganese steel. Reports of tests of these gears and pinions show that they outwear from three to five of the ordinary cut tooth steel gears and pinions. The gears are economical for use on electric travelling cranes, and in other applications where gears and pinions are subjected to hard service.

The company also furnishes manganese steel castings for frogs, crossings, rock and coal crushing machinery, pulverizing mills, stamp mills, dredging machinery, such as bucket lips, sprockets, chain links, etc.

The company is represented by William P. Mellon, Chicago; C. W. Comstock, Cleveland; G. T. Paraschos, Boston; E. O. McCabe, Richmond, Va.; and A. S. Blanchard, C. W. Owston, Jr., and E. R. Stackhouse, Newark, N. J. Louis A. Shepard, who was secretary and manager of sales of Benjamin Atha & Co., is the executive officer in charge of the company.

Holders of railroad certificates should deposit them with Secretary Earl G. Smith.

With Exhibitors and Others

Several features have combined to make the arrangement of exhibits the present year exceptionally attractive. An abundance of room has enabled the various displays to be so disposed as to give to each the advantage of visibility and in many cases the amount of perspective desirable in order to enable its attractive features as a whole to be taken in, while the width of the pier permits a grouping of exhibits within a compact space. In other words, a journey of a half-day or so is not required in order that the display as a whole may be inspected.

Briefly stated, such were the general conditions with which The Railway Supply Manufacturers' Association had to deal. It has dealt with the situation in a most satisfactory manner and it is doubtful if many of the exhibitors appreciate how much they owe to the active officers of this association in affording so satisfactory a setting within which to place their exhibits. It is true that a portion of the booth structure has been seen and used before. Much in the way of separate structures, columns, arched roofing, etc., has been added, while the entire arrangement of the booths is such as to afford the maximum of convenience in every respect. The most satisfactory feature of all, perhaps, will be lost sight of as soon as all exhibits are fully installed; that is, the fact that the booths were all ready for the installation of exhibits before many of them were ready to be installed.

The condition of the installation on the opening morning leaves, as usual, something to be desired in the way of completeness, though some sections, notably Marine Hall, are in a good state of completion. The experience of previous years, however, leads to the belief that by the time the first convention is fairly under way there will be opportunity for little criticism in regard to completeness.

It seems proper to mention here one feature of the work of the Manufacturers' association which has contributed very largely to the convenience of exhibitors, as well as, in most instances, to a saving of expense in their favor. This is the provision of power for such exhibits as are to be shown in operation, the furnishing of matting and furniture as a part of the booth equipment and taking care of various minor matters which tend not only to harmony in the aspect of the various features of the exhibit but to secure for a great many individuals the advantages of wholesale negotiations. A further feature of advantage, in case the associations should again elect Atlantic City as a place of meeting, lies in the fact that much of the material used is of the nature of permanent rather than temporary property and its future use would involve a much less expense than its initial cost.

The track exhibit is in a much more convenient location than in former years. Fortunately for the purpose, the Philadelphia & Reading tracks at Mississippi avenue, two short blocks west of the pier, which is the location of the principal exhibit, extend up to the Boardwalk. These spur tracks are utilized for the display of such exhibits as require track room and the location is only a few hundred feet along the Boardwalk from the pier.

* * *

The Maryland Railway & Electric Supply Company, of Baltimore is the exclusive southern sales agent for Suydam protective paints, which are made up to any furnished or standard railway specifications and are subject to inspection after arrival at destination. These paints are particularly adaptable to freight cars and structural steel. The company also handles car cleaners.

* * *

The Lawrenceville Bronze Company, of Pittsburg, Pa., is exhibiting two of the important specialties manufactured by it —the McGillivray patent hydraulic valve and the Robertson patent blow-off valve. The Robertson blow-off valve is for stationary boilers, and in the design and construction the object is to make a valve body that when once connected to the boiler need never be removed. To secure this the cap, the brass liner and the seat are made removable. The especial advantages claimed for the Robertson valve are: Ease of dismantling and reassembling, only an ordinary monkey wrench being required; permanent connection of the body to the piping; the use of four bolts instead of two to secure the cap; the smooth interior, secured by the use of seamless drawn brass tubing.

* * *

The bells in the National Tube Company's exhibit at Spaces 400-402 on the pier are among the features which first attracted the attention of visitors. These bells are of steel made by the same process as is the Shelby tube. They are formed and not cast, and the manufacturer claims for them the important advantages of withstanding extreme cold without cracking and of having perfect tone.

* * *

One of the newer railroad supply manufacturers which has developed rapidly within the last five years is the Pennsylvania Brake Beam Company, of Danville, Pa. The company was at first located at Easton, Pa., having merely an assembling shop with capacity for some 400 brake beams per day. Later the plant was removed to Danville and the capacity increased fivefold. The large business of the company in 1907 aggravated the difficulties that had been experienced in securing needed material promptly and the situation was met by installing a rolling mill and foundry, which gave the company control of the materials needed and enables it to guarantee deliveries. The officers of the Pennsylvania Brake Beam Company are: President, J. W. Trenchard; vice-president and general manager, E. M. Applebaugh; secretary, S. H. Hitchner.

* * *

The Chicago Railway Equipment Company is exhibiting a new journal box and lid which it is believed will be found of more than ordinary interest. The design, which is known as the Creco, aims at keeping the lid absolutely tight at the top as well as at the bottom, thus making the box dust proof. The Creco lid may be applied to any M. C. B. standard box and any M. C. B. standard lid will fit a Creco box.

* * *

The Damascus Brake Beam Company, of Cleveland, Ohio, is exhibiting a new development in a high speed beam with adjustable heads. In overcoming the many difficulties in perfecting a beam to meet all service requirements and at the same time hang in the limited space on passenger equipment, this company has reduced the number of parts to a minimum, eliminating all loose castings and giving all members a solid bearing, and the simplicity with which all this is accomplished has appealed to the experts who have inspected the device. The advantages claimed for this beam are the solid bearings of ends of beam in cylindrical sleeves, the rigid clamping of the fulcrum at the center of the compression member and the perfect adjustability of the brake head to any position and its thorough rigidity after adjustment.

* * *

A machine is known by the people who use it, and the list of shops using pipe machines built by the Stoever Foundry & Manufacturing Company, Lebanon, Pa., would indicate that this company has a machine of unusual efficiency and durability. Among the railroads using these machines in their shops are the Central of New Jersey, Pennsylvania Railroad, Buffalo & Susquehanna, Chicago Burlington & Quincy, Atlantic & North Carolina, Kansas City Southern, Norfolk & Western, New York Central & Hudson River, Baltimore & Ohio, and Missouri Kansas & Texas, and the list of other large companies includes the American Car & Foundry Company, American Locomotive Works, Baldwin

Locomotive Works, National Transit Company, Standard Oil Company. Several of these shops have a number of the machines in use, those first installed apparently giving such good service that others were ordered. One of these machines can be seen in operation at the company's exhibit at Space 156, Machinery Hall. All visitors will be gladly welcomed and given whatever information is desired.

* * *

The McConway & Torley Company, of Pittsburgh, Pa., is showing in connection with its exhibit of car couplers at spaces 405-409 on the pier a model of the Janney radial coupler designed for interurban and electric railway service. This is a modification of the regular improved Janney passenger coupler, which is in successful service on steam railroads, to suit the requirements of interurban service. The coupler has a wide range of lateral movement to facilitate passing over curves, permitting the operation of trains composed of cars of 50 feet and upwards in length around curves having a radius of 35 feet or even less. The radial movement of the coupler, however, is under spring tension so as to obviate lateral buckling of couplers under the impact shock of coupling and the coupler is normally held in the central position. The tendency of the couplers to buckle when the cars are being pushed around curves is provided for by means of a lug or extension on the side of the coupler head against which the point of the guard arm of the opposing coupler comes in contact under the stress of pushing, thus retaining the couplers substantially in line. The coupler may be uncoupled on either straight or curved track from either side of the car without the necessity of the men going between the ends of the cars. The whole arrangement is simple in construction and very effective in operation and is presented as the solution of the problem of adapting the M. C. B. type of coupler to interurban and street cars thereby providing a thoroughly automatic coupling in compliance with the terms of the safety appliance law, and making it possible to couple cars of this class with cars of steam roads as is some times desirable and especially on such roads as are establishing electric interurban service in connection with their regular steam lines.

* * *

The Massachusetts Mohair Plush Company, of Boston, invites all delegates to stop at Space No. 59 in the ball room, where will be found the newest and most attractive designs in car plushes. These are shown on coach seats built by the leading manufacturers. Space 59 is a comfortable place and interesting to all comers. The exhibit is in charge of J. S. Seabury, a member of the entertainment committee, who is located for the week at the Marlboro-Blenheim. He will be delighted to show samples of goods and talk about plush. He wants to do all he can for the railroad men, and all are expected to make themselves at home at "The Plush Exhibit."

* * *

The Western Railway Equipment Company, St. Louis, Mo., has applied their Acme automatic brake adjuster to about 18,000 cars in the past year. A model of this device is shown in space 372, where this company is showing the usual line of specialties, exhibited for the last 14 years.

* * *

Joseph T. Ryerson & Son are represented by G. H. Pearsall, E. T. Hendee, F. A. Gardner, L. M. Henoch and J. C. Kunzer.

* * *

The Independent Pneumatic Tool Company of Chicago and New York has an unusually interesting exhibit of the well known Thor pneumatic tools and appliances consisting of piston air drills, reaming, tapping, flue rolling and wood boring machines, portable pneumatic grinding machines, wood saws, close-quarter piston air drills, hose couplings and other pneumatic appliances adapted to railroad service. James B. Brady, president; W. O. Jacquette, first vice-president, and John D. Hurley, second vice-president and general manager of the Company, are all in attendance at the convention, and express the belief that while improvement in business during the past few months has not been up to expectations the railroads will require a large amount of new machinery within the next few months for repairing locomotives and cars for use in moving of the crops. The company is making preparations to take care of this expected increase in business by increasing of the force of workmen at its plant, at Aurora, Ill.

* * *

Representatives of the Chicago Railway Equipment Company are pointing out to their visitors the new features of the malleable brake jaws shown in their exhibit. A feature of particular importance is the possibility of fastening the jaw at any angle with ease and security.

* * *

During the nearly 14 years of its existence the Pocket List of Railroad Officials has made itself a necessity not only in every railroad office but as a part of the working equipment of everyone having business dealings with railroad officers. It goes without saying that the chief essentials of such a publication are completeness and accuracy. The List includes all railroad officers from president and chairman to track supervisor and shop foreman, properly classified and arranged. Accuracy is insured by the most constant watchfulness and all lists of officials are revised for every issue, not only in the office of the publishers but by the proper authority on the part of the railroads themselves. Constant users of the publication are authority for the statement that being led astray by any information in the Pocket List is an unusual thing.

* * *

Master car builders can get the hook—but in no vicious sense—by calling at the booth of the Keystone Drop Forge Works. This is at space No. 379 in the Amusement room on the pier. The illustration herewith is the close fitting type. The convention souvenirs of this concern are nickel-plated connecting links showing another specialty of interest to railroad mechanical men.

* * *

A number of railroads have been supplementing savings effected by chemically treating the water used in their locomotive boilers by the introduction of an automatic hot water boiler washing system. The National Boiler Washing Company has developed and patented a system wherein the hot water blown out of boilers is filtered and automatically tempered for boiler washing purposes, the steam blown out of a boiler heating enough fresh water to 200 degrees F. to refill the boiler. The savings claimed for the systems are: 1,050 pounds of coal, 2,000 gallons of water and three hours of the boiler washer's time for each boiler washed; also from three to five hours time in preparing the engine for service, 25 per cent reduction in flues, staybolt and firebox repairs and 10 per cent more work performed by engine house men. The company has blue prints and photographs on exhibition at the convention.

* * *

The Buffalo Brake Beam Company is showing an ingenious brake beam hanger. It is a safety device as well as a money-saver in the application of brake beams to equipment, as it is designed to eliminate safety chains.

* * *

The Safety Car Heating & Lighting Company reports that information as to the status of the art of car lighting in Europe is to the effect that electric car lighting has come to a stand still, while the progress of incandescent gas (mantle) lighting is very active, especially with regard to changing over the old fixtures to the incandescent system, the railroads having thoroughly satisfied themselves, after long

tests, of the value of the incandescent gas system, and they are now rapidly changing over their cars at the rate of betwen 500 and 600 lamps per day.

* * *

The Norton Grinding Company of Worcester, Mass., has on exhibition a pair of car wheels, one of which has been ground by the car wheel grinding machine manufactured by this company. The other wheel is in the same condition that the ground one was before grinding, the contrast showing the value of the machine for putting car wheels into such shape as to make them as good as new after flat spots have appeared. The machine for grinding these wheels is very heavy, weighing 15 tons. The time required for grinding a pair of wheels like that shown is given as from five minutes to 1¼ hours, according to the condition of the wheels when they come to the machine. In the case of the wheels on exhibition the time required was 15 minutes.

* * *

Falls Hollow iron is reported in engines of the different railroads in nearly every country on the globe, an indication that the hollow bolt is giving satisfaction.

* * *

The Independent Pneumatic Tool Company, Chicago, is exhibiting a complete line of its Thor piston air drills and reamers, pneumatic flue rolling, tapping and wood boring machines, portable penumatic grinding machines, pneumatic chipping, calking, beading and riveting hammers, pneumatic wood saws, hose, couplings, and other air appliances, at the conventions. The company has spaces Nos. 205, 207, 209 and 211 on the pier, and eight representatives are in attendance.

* * *

The Dearborn Drug & Chemical Works, manufacturer of boiler water treatment, which has an interesting exhibit at the end of the pier, is represented at the convention by George R. Carr, vice-president; G. W. Spear, vice-president; J. D. Purcell, assistant general manager; D. E. Cain, western manager, and H. G. McConnaughy of the New York office. Robert F. Carr, president of the company, expects to be here for a few days before the convention closes.

* * *

W. B. Leach, the general manager and treasurer of the Hunt-Spiller Manufacturing Corporation, is, for the fifth consecutive convention, exhibiting a very interesting selection of locomotive castings. Mr. Leach has met with marked success since he became connected with the management of this company, and his efforts in introducing the Hunt-Spiller gun iron have resulted in the railroad men becoming thoroughly acquainted with this specialty.

* * *

An exhibit that is sure to create considerable interest is that of the Lancaster Machine & Knife Works, at space No. 147, where are shown the possibilities of the Derrer shape attachment as applied to the ordinary engine lathe. This machine will bore a square hole and turn a piece to fit it as accurately as if the hole were round. The Company's line of oval taper drill sockets and drills is a vast improvement over the ordinary taper drill with the tang, and offers a solution of the drive problem in drills and chucks.

* * *

The Central Inspection Bureau, 17 State street, New York, has received the contract for the inspection of 300 box cars of 30 tons capacity to be built by the American Car & Foundry Company at the Berwick works for the Lehigh & New England and 350 coal cars of 40 tons capacity to be built at the Cambria works, Johnstown, Pa., for the same road.

* * *

No car equipment is perfect unless its windows are weather, dust and noise proof, as well as easy and efficient to operate, and the National Lock Washer Company invites examination of its new window sash locks, curtains and fixtures which are exhibited at the conventions. This concern has been for over 22 years engaged in the manufacture of nut locks, and its curtain and window fixture department has become a considerable branch of the business, occupying a large three-story building recently erected, and increasing facilities 300 per cent.

* * *

The exhibit of the G. Drouve Company, Bridgeport, Conn., manufacturer of the Anti-Pluvius skylight and the Lovell window operator, both of which are extensively used by railroads, shows these specialties to advantage, and anyone having to do with skylight or window operating maintenance will find much to interest him. The exhibit is at space No. 471 near the Greek temple.

* * *

Wood's P. & W. hose preservative is a preparation for use on air brake and pneumatic tool hose where vibration is pronounced, and is guaranteed to prevent the cracking of rubber and other deterioration due to climatic changes. It is easily applied with a brush and the cost is comparatively small, as the figures given are 87 cents for material and 16 cents for labor will cover 100 pieces of air brake hose each 1⅜ by 22 inches.

* * *

A perfect car lighting system should be reliable, automatic self-contained, independent of charging plants, not dependent on the motion of the train and absolutely safe, and this is the claim of the Gold Car Heating & Lighting Company for its new system of car lighting.

* * *

The firm of Bush & McCormick of Columbus, O., has a booth at the convention adjoining that of the Buckeye Steel Castings Company and is exhibiting the McCormick draft gear, McCormick hand switching brake, Bush anti-friction center bearing and the Woods anti-friction side bearing.

* * *

The Scullin-Gallagher Iron & Steel Company now controls and is exhibiting at its booth, the Excel coupler, which attracted so much attention at the convention last year when exhibited by the inventor, James Timms. A few improvements have been made, notably in the operating mechanism, which will be gladly explained by Mr. Timms and the representatives of the company.

* * *

The Gold Car Heating & Lighting Company has a novel device for steam couplers in the automatic lock and hose support, which, as the name implies, is designed automatically to lock the couplers and at the same time support the hose.

* * *

The owners of Zenoleum disinfectant regret that they are not on the pier during this Convention. They have, however, an operating exhibit in the great majority of passenger coaches throughout United States and Canada, as 80 of the leading American railroad companies are using Zenoleum disinfectant in their coaches and passenger stations.

* * *

The Standard Car Truck Company is exhibiting for the first time this year a Barber double-action roller-bearing truck with no load at the center plate. Two other styles of trucks are also shown, one being a Barber roller-bearing lateral motion tender truck and the other a Barber roller-bearing freight truck. Both trucks are equipped with the Barber roller-bearing center plate.

* * *

It has been the practice of the Westinghouse companies to have a very extensive working exhibit every alternate year of the conventions. As the 1907 exhibit was the most elaborate ever made the working features have been omitted this year. A new type of lamp is being used to light the exhibit space. It is known as Type O of the Cooper Hewitt Electric Company of New York. Circulation of air is provided by a line of 12-inch, 110-volt, alternating current fans of the Westinghouse Electric & Manufacturing Company. The ex-

hibits of the American Brake Company and the Westinghouse Automatic Air and Steam Coupler Company are referred to under these respective names. An interesting and comprehensive collection of enlarged photographs of apparatus and installations of the various Westinghouse interests are shown in a revolving stand.

* * *

The American Brake Company is exhibiting in the space of the Westinghouse companies, spaces 540-542, models of its automatic slack adjuster.

* * *

The Westinghouse Automatic Air and Steam Coupler Company is showing models of its automatic air and steam couplers in the space of the Westinghouse companies, spaces 540-542.

* * *

Five, six and a seven-feed lubricators are new features of this year's exhibit of the Michigan Lubricator Company. The seven-feed is for superheated steam locomotives. There is also a model for demonstrating a new automatic drain valve for locomotive lubricators.

* * *

Two new styles of couplers are interesting features of the exhibit of the National Malleable Castings Company. The first of these is a side-opening Climax and the other a bottom-opening style called the Vulcan. This latter is designed to permit free movement of the coupler in all directions. The exhibit also includes a collection of proper and improper coupler repair parts, the latter being made by outside companies or persons. Other features are cast and malleable iron washers, malleable iron track and shop wrenches, National brake jaws and dead lever guides, push rod jaws and brake levers, new improved National car door fastener, and National Climax journal boxes for freight and passenger cars.

* * *

Worth Brothers Company, Coatesville, Pa., maker of open hearth steel plates, acid or basic, for all boiler purposes, locomotive fireboxes, etc., has no exhibit, but will be ably represented by its sales department.

* * *

The Wells Light Manufacturing Company is exhibiting a novelty—an unbreakable file handle.

* * *

Hale & Kilburn, Philadelphia, have an extensive exhibit of steel doors, sashes and seats. A large number of wooden-ended seats, the famous "Walkover" car seats, in rattan, plush and leather are also shown.

* * *

The Standard Paint Company, New York, has a very pleasing reception room, furnished in mission furniture. The attraction is an aquarium containing gold fish. The vessel is lined with "Ruberoid Roofing."

* * *

The Carborundum Company, Niagara Falls, exhibits in booth 467 a large variety of shapes and sizes of grinding wheels and sharpening tools. The exhibit also contains a number of selected crystals.

* * *

Among the new exhibitors is the Asbestos Protected Metal Company of Canton, Mass. This company is showing a unique protection for car roofs in the way of an asbestos-coated sheet of steel.

* * *

Although the victim of a freakish railroad accident while en route to Atlantic City, the exhibit of McCord & Co. shows no present signs of a rough and peculiar experience. It was housed in one of two cars which jumped the track and rolled down a 40-foot embankment after breaking out of the middle of a long train. The exhibit includes McCord journal boxes, draft gear, spring dampeners and lubricators. In the last-named is something new in the form of a force feed lubricating system for locomotive driving boxes, guides, cylinders and air pumps. Each of these branches may be run independently of the others, or all may be run together. The lubricator will pump against any pressure. The oil reservoir has two chambers for valve and engine oil respectively. It is stated that the device has been tested thoroughly in service on several well-known roads.

* * *

This year the Farlow Draft Gear Company exhibits on the pier, spaces 428-432, models of its various types of draft gear. The Seaboard Air Line model shows the malleable iron draft sill as applied to wooden underframe cars. The Great Northern model shows the twin spring gear applied to channel center sills, which is reported as giving exceptionally satisfactory service. The draft gear as applied to wooden underframe cars is also shown. In view of the extensive report made by the standing committee on tests of the M. C. B. couplers relative to Friction Draft Gear, another part of the exhibit will be found interesting; this shows the Farlow attachments in combination with the Westinghouse friction barrel as used by the Atlantic Coast Line on 8000 cars. It is claimed for this combination that it is absolutely indestructible, not only saving the car but also preventing damage to the friction barrel.

* * *

The Yale & Towne Manufacturing Company has devised a novel way in which to show the working of a Yale lock. The exhibit includes a model of a lock, enlarged about 70 times. A motor is used to demonstrate the application of the paracentric key.

ARMBRUST BRAKESHOE.

Armbrust brakeshoes, made by the Love Brakeshoe Company, Fisher building, Chicago, are used on steam and electric surface and elevated roads. Economy, safety and mechanical excellence are claimed for these shoes, the special points on which these claims are based being as follows:

(1) By spacing the brake head away from the back of the shoe-body proper the entire shoe-body may be worn out without danger of wearing into the brake head, even when the wear is uneven. The shoes will wear down to the scrap weight of about four pounds without requiring special attention.

(2) When the car shoe-body is entirely worn out the brake head is still ½ inch away from the shoe-body proper on account of the spacing lugs.

(3) A steel connector is cast in the spacing lugs, but not in the body of the shoe, avoiding weakening the latter.

(4) The car shoe is scored through the center to make any accidental breakages occur at that predetermined immaterial point, thereby preventing the shoe from breaking at other material points. This also allows it to rest back against the brake head at the four points of contact, throwing the unnatural strain from the shoe onto the brake head, thus adding life and safety to the shoe; but should the shoe break at any point the steel connector, being cast in the spacing lugs, will hold the broken parts in place until entirely worn out and prevent broken parts from falling to the tracks, thus avoiding danger of wrecks from broken brakeshoes.

The foregoing statements about the car shoe apply to driver and motor shoes, with the following additions:

The driver shoe has a central holding lug so that it may be pinned to the brake head. Where this feature is not desired the shoe is made to be bolted and hooked on in the old way. The advantages claimed for the central holding lug are: (1) Rights and lefts are unnecessary; (2) the shoe may be turned if it wears unevenly, or faster on one end than the other; (3) this construction lessens the cost of application. The Armbrust traction shoes may be applied to M. C. B. brake heads, or any special brake heads used by traction systems, without change.

LIST OF EXHIBITS.

Owing to the fact that some exhibits are yet to be installed and further that some which are under way are as yet incomplete it is impossible to give in this issue a list of all exhibits. The following is, however, fairly complete. We shall be grateful to exhibitors if they will leave at the office of The Railway Age Gazette any corrections or additions to this list.

A. B. C. Bearing Corporation, Richmond, Va.—A. B. C. solid, lead-lined journal bearings reinforced with malleable iron; A. B. C. wedges. Represented by Walter D. Thomas.

Adams & Westlake Company, Chicago.—Adlake-Newbold electric car lighting system, Adlake acetylene gas car lighting system, continuous and removable bottom basket racks, Lindstrom brake handles, car trimmings, sliding door locks, signal lamps, long time burners for signal lamps, Represented by E. L. Langworthy, W. H. Baldwin, F. N. Grigg, E. H. Stearns, A. S. Anderson, C. B. Carson, R. M. Newbold and G. L. Walters.

Amberg Car Truck Company, Chicago.—Articulated side frame truck, Acme oil box and lid. Represented by W. E. Amberg.

American Balance Valve Company, Jersey Shore, Pa.—Balanced high-pressure slide valves, balanced semi-plug piston valves, balanced semi-plug valve for Baldwin compound engine, Walschearts valve gear model, model of modified Stevens with Jack Wilson's double-acting internal admission valves and other models. Represented by J. T. Wilson and Frank Trump.

American Blower Company, Detroit, Mich.—The new A B C multi-vane dynamic blower; type A vertical self-oiling engine; an A B C high-pressure blower in operation, holding in suspension a heavy ball 18 inches in diameter; the A B C steam-heating coils; the new Vento radiation; A B C moist air dry kiln; ventilating fans; exhaust fans, etc. Represented by Clayton W. Old, R. B. Bedford and H. F. Old.

American Brake Shoe & Foundry Company, Mahwah, N. J.—Steel back locomotive, coach and car brake shoes, steel back brake shoes for heavy electric railway service. Represented by W. S. McGowan, Frank L. Gordon, Charles Herron, F. W. Sargent, H. S. Bradfield, E. L. Janes, E. J. Searles, E. B. Smith, J. S. Thompson, L. R. Dewey, Otis H. Cutler, J. D. Gallagher and J. B. Terbell.

American Car & Foundry Company, St. Louis.—Pennsylvania Railroad steel passenger coach, class P-70, track exhibit. Represented by Scott H. Blewett, W. C. Dickerman, John McE. Ames, A. E. Ostrander, H. P. Field, Jr., E. H. Fisher, William F. Lowry, W. S. Johnson, G. A. Johnson and Frank Faust.

American Engineer and Railroad Journal, New York.—Copies of American Engineer and Railroad Journal. Represented by R. M. Van Arsdale, J. S. Bonsall, R. V. Wright and E. A. Averill.

American-LaFrance Fire Engine Company, Elmira, N. Y.—Two-wheel chemical fire engines, non-freezing fire extinguishers, Babcock fire extinguishers, approved and labeled fire extinguishers, automobile fire extinguishers. Represented by F. M. Watters, A. G. Morse and Hugh Logan.

American Locomotive Company, New York.—Reception booth. Represented by Leigh Best, H. F. Ball, David Van Alstyne J. D. Sawyer, G. M. Basford and A. Haller.

American Mason Safety Tread Company, Boston.—Mason safety treads, Empire safety treads, Karbolith composition floors for cars and buildings. Represented by Henry C. King, L. H. Myrick and J. W. Scott.

American Multigraph Sales Company, Cleveland, Ohio.—The Gammeter multigraph, multiple typewriter and office printing press. Represented by F. G. Harris, H. M. Horr and L. C. Clark.

American Railway Master Mechanics' Association Committee on Apprenticeship.—Models, drawings, photographs and methods of instruction. Represented by C. W. Cross and W. B. Russell.

American Steam Gauge & Valve Manufacturing Company, Boston, Mass.—Muffled and open pop safety valves, standard locomotive steam gages, Thompson improved indicator, dead weight gage tester, locomotive chime whistle, automatic hydraulic recording gage, duplex air brake gage. Represented by Ralph B. Phillips, Gardner Cornett, C. A. Allen and E. H. Smith.

American Steel Foundries and Simplex Railway Appliance Company, Chicago.—Cast steel body and truck bolsters, brake beams, Simplex body and truck bolsters, cross heads, R. E. Janney coupler, Simplex freight and passenger coupler, Andrews side frames, Davis wheels, springs, cast steel journal boxes, Susemihl side bearings, complete truck mounted on revolving turn table, aluminum model of complete truck, test bars and tested couplers. Represented by G. E. Scott, R. H. Ripley, D. W. Call, Theodore Cook, F. K. Shults, Geo. C. Murray, Andrew Crozier, J. V. Bell, T. D. Kelley, D. T. Harris, G. E. Slaughter, Jas. Maher, J. Soule Smith, H. P. Shaw, W. W. Butler and W. A. Blanchard.

American Vanadium Company, Pittsburg, Pa.—Vanadium ore, oxides and alloys; bars of all types of Vanadium steel, fine roller stock, automobile springs, railroad draft, tender and driving truck springs, crankshafts, axles, lathe tools, pneumatic hammer rivet dies, driving tire, valve arm, cast bronze and steel pulleys, ball races, transmission bars, engine frame, solid steel wheels and torpedo tube. Represented by J. M. Flannery, J. Kent Smith, W. L. Turner and T. F. V. Curran.

Anchor Packing Company, Philadelphia, Pa.—Rubber packings for locomotives.

Armstrong Brothers Tool Company, Chicago, Ill.—Tool holders for lathes, planers, shapers and slotters, ratchet drills, lathe tools, lathe dogs, planer jacks, drill press vise. Represented by John McBride.

Asbestos Protected Metal Company, Canton, Mass.—Robertson inside car roof, asbestos protected metal, flat, corrugated and beaded roofing and siding, special roof paint, roof cement, roofing nails. Represented by H. H. Robertson, J. T. Crawford and Robert J. Mollan.

Baldwin Locomotive Works and Standard Steel Works Company, Philadelphia, Pa.—Reception booth. Represented by S. M. Vauclain, S. M. Vauclain, Jr., H. de H. Bright, G. Greenough, J. W. Converse, Charles Riddell, F. W. Weston, George F. Jones and E. B. Halsey.

Bardons & Oliver, Cleveland, Ohio.—Automatic chuck turret lathe, 4 inches x 30 inches, No. 4 Universal brass-working turret lathe. Represented by George C. Bardons, John G. Oliver and S. E. Horton.

Barnett Equipment Company, New York.—Barnett connector, coupling the signal, brake, steam heat and safety hooks; Barnett universal steam hose coupler; Schultz flexible train connection. Represented by S. D. Barnett, R. A. Wolff and L. G. Morris.

Beaudry & Co., Boston.—One No. 6, 150-pound Champion power hammer, three small nickel-plated models of hammers. Represented by Alex Beaudry and Otto Abrahamsen

Besly, Charles H. & Co., Chicago.—No. 14 Besly spiral disc grinder with geared lever feed table in operation, Helmet spiral circles, Helmet babbitt, Helmet oil, Helmet temper taps of all descriptions. Represented by Edward P. Welles and C. A. Knill.

Bettendorf Axle Company, Davenport, Iowa.—All steel 100,000-pound steel box car complete, equipped with the Bettendorf single I-beam center sill and cast steel center sill ends and Bettendorf all cast steel trucks with journal boxes cast integral and Bettendorf I-beam bolsters; one Bettendorf single center sill 36-foot 30-ton steel stock car underframe equipped with Bettendorf swing motion trucks, Bettendorf trucks and bolsters; one 40-foot 100,000-pound all steel drop bottom gondola car equipped with Bettendorf single I-beam center sill, cast steel center sill ends, Bettendorf all cast steel trucks. Represented by W. P. Bettendorf, J. W. Bettendorf, J. H. Bendixen and G. N. Caleb.

Bickford Drill & Tool Company, Cincinnati, O.—A working exhibit consisting of a five-foot full universal radial drill, motor driven. Represented by H. L. Beeler, H. M. Norris.

Bird-Archer Company, 90 West Street, New York.—Chemicals for boiler feed water, coach cleaner, Filion vestibule folding

trap, Fritts anti-waste grabber, Anderson-Lacy electric headlight. Represented by P. B. Bird, V. O. Lawrence and Nat. P. Lane.

Bliss Electric Car Lighting Company, Milwaukee, Wis.—Axle driven head end system type C-2, individual car lighting equipment type C-3, export equipment type E-1, Santa Fe equipment type F, Pullman equipment type A, type L generator, type E generator with suspension, type K generator, train line couplers, tungston, tantalum and high efficiency carbon lamps. Represented by Col. Jno. T. Dickinson, W. L. Bliss, F. Urban, A. W. Berresford and Geo. Mueller.

Bowser, S. F. & Co., Fort Wayne, Ind.—Bowser system of oil storage, long distance self-measuring pumps, power pump, adjustable-measure cabinets, small self-measuring outfits, tanks and pumps for machine and paint shops, roundhouses, engine rooms, storerooms. Represented by C. A. Dunkelberg and W. T. Simpson.

Brewer Brothers Company, Philadelphia.—Patent folding traps for vestibuled cars, samples of wrought iron and steel hardware. Represented by Charles E. Griffith, A. Brewer, R. Brewer and M. C. Brewer.

Brill Company, J. G., Philadelphia.—Brill truck No. 27 E 3.

Brown & Sharpe Manufacturing Company, Providence, R. I.—No. 3-A heavy universal milling machine, No. 5-B heavy plain milling machine, No. 3 vertical spindle milling machine, and following attachments: vertical spindle, universal, high speed, rack cutting, slotting, indexing. Represented by R. T. Eaton, C. A. Ballou, H. McGregor and John Parker.

Buckeye Steel Castings Company, Columbus, Ohio.—Major couplers fitted with various operating mechanism. Buckeye cast steel body and truck bolsters, Buckeye cast steel truck frames and Buckeye cast steel pivoted yokes. Represented by S. P. Bush, George Groobey, A. H. Thomas, George T. Johnson and J. C. Whitridge.

Buffalo Brake Beam Company, 30 Pine Street, New York.—Special all steel brake beams, standard solid beams all weights, forged steel brake heads, forged fulcrums, forged wheel guards, forged chain clips, special safety hangers, steel back brake shoes. Represented by S. A. Crone, E. Strassburger, R. C. Fraser, C. E. Barrett, E. C. Farlow and C. J. Zacher.

Burroughs Adding Machine Company, Detroit, Mich.—Burroughs adding and listing machines, special machines arranged for railroad shop accounting. Represented by F. A. Willard, T. M. Jones, I. L. Berk, F. Spiekerman, F. E. Woodward and E. S. Newman.

Bush & McCormick, Columbus, Ohio.—McCormick friction draft gear, McCormick hand switching brake, Bush anti-friction center bearing, Woods' anti-friction center and side bearing. Represented by S. P. Bush, Jno. H. McCormick and Edwin S. Woods.

Butler Drawbar Attachment Company, Cleveland, Ohio.—Friction and spring draft gears, Piper friction gear with standard springs, Piper friction gear with special springs, Tandem spring gear, 6¼ by 8-inch springs, wood underframe; tandem spring gear, 8 by 8-inch springs, steel underframe. Represented by Geo. L. Weiss and W. B. Waggoner.

Calculagraph Company, New York, N. Y.—An instrument containing clock work mechanism and printing machinery which subtracts and records elapsed time furnishing absolute accuracy for the basis of shop cost operation. Represented by Philip R. Simmonds.

Car Lubricator Company, Utica, N. Y.—Metal frame journal lubricator, with cotton web and wire wicks. Represented by Geo. J. Bingham, B. T. Gilbert and G. P. Simmons.

Cardwell Manufacturing Company, Chicago.—Draft gear, side bearings, center plates. Represented by J. R. Cardwell, C. H. Tobias and W. G. Krauser.

Carey, Philip Manufacturing Company, Cincinnati, Ohio.—85 per cent magnesia locomotive lagging, 85 per cent magnesia pipe and boiler coverings, train pipe coverings, asbestos and felt pipe coverings, asbestos sheathings, millboards and fibers, asbestos packings and gaskets, asbestos cold water paints, insulating materials, magnesia flexible cement, roofing, magnesia roofing paints, asphalt paints, deadening and building felts, lith and linofelt freight car roofing. Represented by N. S. Kenney, Steve J. Bowling, W. I. Kelley, J. G. Howley and W. H. Scobie.

Carborundum Company, The, Niagara Falls, N. Y.—Carborundum grinding wheels and sharpening stones in many forms, crystals of carborundum. Represented by George R. Rayner, R. B. Fuller, W. W. Sanderson and Charles Nicholson.

Celfor Tool Company, Chicago.—Celfor twist drill, Celfor chuck, Rich flat drill, Rich chuck. Represented by E. B. Clark, Russell Dale, W. F. Heacock, Wm. Brewster and W. E. McCabe.

Central Railroad of New Jersey—On exhibit track an air brake instruction car. Represented by H. L. Sandhas.

Chase, L. C. & Co., Boston.—Chase's "Goat Brand" mohair car plushes, in high and low pile for car seats. A full line of colors and frieze patterns for coach and parlor car work. Exhibits showing process of manufacture. Represented by R. R. Bishop, Jr.

Chicago Car Heating Company, Chicago.—Vapor system of car heating, pressure system of car heating, steam hose couplers, steam traps, train pipe valves and hot water specialties. Represented by Egbert H. Gold, Frank F. Coggin, B. A. Keeler and Edward A. Schreiber.

Chicago Pneumatic Tool Company, Chicago.—One 419-foot compound belt driven air compresser, class G-CB, with mechanically operated inlet valves; complete line of Boyer & Keller pneumatic riveting, chipping and calking hammers; complete line of Little Giant, Boyer & Keller drills, reamers, wood boring machines and flue rolling and tapping machines; complete line of alternating and direct current electric drills, grinders, blowers and hoists; complete line of vacuum cleaners for residences, railroads, hotels, etc. Represented by Thomas Aldcorn, G. A. Barden, J. C. Campbell, Fred Severin, Jos. Parr, W. P. Pressinger, C. B. Coates, W. O. Duntley and J. W. Duntley.

Chicago Railway Equipment Company, Chicago.—Creco, National Hollow, Kewanee, Diamond, Reliance, Sterlingworth, Monarch and 96 types of brake beams; Monitor bolsters, Creco journal box and lid, brake jaw, slack adjuster and roller side bearing. Represented by E. G. Buchanan, Geo. A. Cooper, F. T. DeLong, Fred. G. Ely, H. W. Finnell, Harry W. Frost, E. B. Leigh, Edwin F. Leigh, B. F. Pilson, Raymond H. Pilson, C. H. Williams, Jr., and C. P. Williams.

Cincinnati Machine Tool Company, Cincinnati, O.—One high speed 20-inch drill, one 24-inch sliding head drill with back gear, patent positive geared feed, quick return, patent geared tapping attachment, variable speed motor drive, one Cincinnati drill vise. Represented by Augustus H. Tuechter and Sherman C. Schauer.

Cincinnati Milling Machine Company, Cincinnati.—No. 4 vertical high power milling machine, No. 4 horizontal high power milling machine, set of milling machine attachments. Represented by Charles S. Gingrich and John L. Bishop.

Cincinnati Planer Company, Cincinnati, Ohio.—Forge planer, 37 by 37 inches by 8 feet, motor driven with speed box. Represented by B. B. Quillen and George Langen.

Clark, A. C. & Co., Chicago.—The Clark mechanical boiler cleaner. Represented by A. C. Clark and Wm. C. Smith.

Cleveland Car Specialty Company, Cleveland, Ohio.—Pressed steel carlines for inside and outside roofs, curved pattern for window roof and styles for baggage or express cars and for passenger cars, pressed steel side posts for passenger car, pressed steel window posts for passenger car, pressed steel lower deck roof support for passenger car, pressed steel spring plank for car and tender trucks. Represented by Geo. L. Weiss, Joseph A. Costello and W. B. Waggoner.

Coe Brass Manufacturing Company, Torrington, Conn.—Extruded metals in variety of special shaped bars and moldings. Represented by E. J. Steele, Wm. W. Cotter and Wm. H. Rippere.

Coe, W. H., Manufacturing Company, Providence, R. I.—Coe's gilding wheels, ribbon gold and aluminum leaf, Hiburnish bronze powders, Hiburnish bronzing liquid. Represented by Chas. H. Bowers.

Commercial Acetylene Company, New York.—Acetylene safety storage system as applied to car lighting, locomotive headlights, signal lights, etc.; tanks cut open to show method of packing with asbestos discs. Represented by Oscar F. Ostby, R. E. Bruckner, R. J. Faure, E. T. Sawyer and H. G. Doran.

Commonwealth Steel Company, St. Louis.—Steel castings, bolsters truck center frame, model of driving wheel center, on exhibit track a cast steel tender frame. Represented by Clarence H. Howard, H. M. Pflager and George E. Howard.

Consolidated Car-Heating Company, New York.—All kinds of heating apparatus for railroad cars. Represented by Cornell S. Hawley, W. S. Hammond and Thomas Farmer, Jr.

Consolidated Railway Electric Lighting & Equipment Company, New York.—System of electrically lighting steam railways by electricity, Consolidated axle light system, Kennedy regulator and indicating and recording attachment. Represented by P. Kennedy, J. L. Watson, Thos. L. Mount and L. J. Kennedy.

Crosby Steam Gage & Valve Company, Boston.—Locomotive valves, gages, blow-off valves, globe and angle valves, chime whistles, wheel pins, recording gages, indicators, etc. Represented by E. C. Kenyon, J. J. McCormick, Charles Carlson, H. B. Forbes and A. B. Carhart.

Curtain Supply Company, Chicago.—Ring No. 88 fixtures, Ring No. 89 fixtures, Forsyth No. 86 fixtures, Acme cable fixtures, Climax cable fixtures, Burrowes No. 83 fixtures and car curtain material. Represented by W. H. Forsyth, R. F. Hayes and S. W. Midgley.

Damascus Brake Beam Company, Cleveland, Ohio.—Waycott special high speed beams, Waycott freight beams, Damascus beams, improved adjustable brake heads, forged fulcrums. Represented by P. T. Handiges and Albert Waycott.

Davis, John Company, Chicago.—Regulating valves for steam hose coupling, back pressure valves, pump regulators, float valves, regulating valves for water, blow-off valves, regulating valves for air, balance valves. Represented by George F. Hughson.

Davis Solid Truss Brake Beam Company, Wilmington, Del.—Davis solid truss brake beams, Davis solid steel back brake shoe. Represented by Nathan H. Davis, Thomas C. Davis, C. Theo. Buchholz and Herman Bohl.

Dearborn Drug and Chemical Works, Chicago.—Samples of boiler tubes and photographs showing the pitting and corrosive action of strong alkali waters and waters containing free acid, and the heavy scale formation resulting from waters containing sulphates and carbonates of lime. A practical demonstration of the results from use of these different classes of waters is made, and thorough information also given as to the methods employed by the Dearborn Company in analyzing water supplies and preparing treatment to offset the injurious conditions, thereby keeping locomotive boilers free from scale, corrosion, or pitting, and preventing foaming. Represented by Robt. F. Carr, George R. Carr, J. D. Purcell, D. E. Cain, G. W. Spear and H. G. McConnaughy.

Detroit Hoist & Machine Company, Detroit, Mich.—Geared pneumatic hoists, 1 to 10 tons capacity; Detroit pneumatic locomotive turn table tractor, Detroit combination electric and pneumatic turn table tractor. Represented by J. C. Fleming and Frank B. Fleming.

Detroit Lubricator Company, Detroit, Mich.—Full line of Bull's eye lubricators from one to seven feeds, including a sectional twenty-one and an air cylinder lubricator, a device whereby the air cylinder of air pump may be lubricated from the cab; packless radiator valves. Represented by A. D. Howard and A. B. Wetmore.

Diamond Machine Company, Providence, R. I.—Guide bar grinder, wet tool grinder. Represented by A. W. Graham.

Dickinson, Paul, Inc., Chicago.—Dickinson fire-proofed wood and cast-iron smoke jacks, caboose jacks, car ventilators, cast-iron building ventilators and chimneys. Represented by Wm. A. Bither, A. J. Filkins and J. A. Meaden.

Dill Machine Company, T. C., Philada., Pa.—Slotting machines and Dill drives. Represented by T. C. Dill and Robert Russell.

Dixon Crucible Company, Jos., Jersey City, N. J.—Crucibles of all kinds, graphites, lubricants, pencils, motor greases, stove polishes, graphite paint, automobile grease, black lead, plumbago. Represented by De Witt Smith, L. H. Snyder and Neville J. Rowland.

Dressel Railway Lamp Works, New York.—Locomotive headlights, locomotive classification lamps, tail marker lamps, locomotive gage lamps, headlight burners, railroad switch lamps, semaphore signal lamps. Represented by F. W. Dressel, Robert Black, H. S. Hoskinson, F. W. Edmunds, E. W. Chester and E. W. Hodgkins.

Drouve Company, G., Bridgeport, Conn.—Anti-Pluvius skylights, Lovell window and sash operator, and Cibulas car ventilating sash operator. Represented by William V. Dee.

Duff Mfg. Company, Pittsburg, Pa.—Barrett car and track jacks and geared ratchet jacks, Duff ball bearing screw jacks, journal jacks, wrecking jacks. Represented by T. A. McGinley, Geo. A. Edgin, E. M. Fisher and R. A. Patterson.

Duner Company, Chicago.—Car closets. Represented by John C. Duner and F. L. Wells.

Edwards Company, O. M., Syracuse, N. Y.—Window fixtures, metal sash, steel extension platform trap doors and fixtures, sash balances, tin barrel spring rollers, railway devices. Represented by O. M. Edwards, E. F. Chaffee, Franklyn M. Nicholl, G. G. Norris and C. H. Rockwell.

Electric Railway Journal, New York.—(A consolidation of the Street Railway Journal and the Electric Railway Review) Copies of Electric Railway Journal and engineering books. Represented by James H. McGraw, J. M. Wakeman, H. W. Blake, Rodney Hitt, C. A. Babtiste and W. K. Beard.

Electric Storage Battery Company, Philadelphia, Pa.—Several types and styles of Chloride accumulator and Tudor accumulator car-lighting cells, standard and special types of cells for semaphore and inter-locking plants in signal service, sparking batteries, Exide vehicle cells, Chloride cells for heavy traction and for gasoline motor cars for railroad service. Represented by Chas. Blizard, John R. Williams, E. L. Reynolds, F. L. Kellogg and H. E. Hunt.

Enterprise Railway Equipment Company, Chicago.—Dump car. Represented by Argyle Campbell.

Evans-Almirall & Co., New York.—Model apparatus of heating system for car barns, round houses, railroad shops and car building plants. Represented by Benj. Kauffman, C. D. Allan and Douglas Sprague.

Falls Hollow Staybolt Company, Cuyahoga Falls, Ohio.—Falls hollow and Falls solid staybolt iron; samples nicked and broken to show the superior quality of metal and fibre. Other samples threaded and doubled flat on themselves and pieces hammered flat endways. Represented by C. M. Walsh, F. C. Lippert and Benj. C. Bradford.

Farlow Draft Gear Company, Baltimore, Md.—Four models of Farlow draft gear to steel underframes, one model of Farlow draft gear to wood draft sills, one model of Farlow draft gear to malleable iron draft sills. Represented by Dwight F. Mallory, I. O. Wright, B. S. Johnson, M. A. Garrett and C. M. Garrett.

Flannery Bolt Company, Pittsburg, Pa.—Tate flexible staybolts and tools for applying same to locomotive fire boxes. Represented by B. E. D. Stafford, J. Rogers Flannery, Harry A. Pike, Tom R. Davis and W. M. Wilson.

Flexible Compound Company, Philadelphia.—Flexible compound, Flexible black enamel, No. 75. Represented by Thos. H. Downward and Harry A. Brognard.

Forsyth Brothers Company, Chicago.—Metallic car window sash, high capacity buffing device for passenger car platform, high capacity friction draft gear, chaffee draw bar centering device, safety deck sash ratchets, car seat beaters. Represented by George H. Forsyth, A. L. Whipple and Louis A. Gray.

Foster Company, W. H., The, New York.—Staybolt machines, bolt cutting machines, staybolt drilling machines, nut topper, bolt altering machine, die grinder. Represented by B. D. Jackson.

France Packing Company, Tacony, Pa.—Metallic packing and fibrous packing for every class of service. Represented by A. W. France and G. E. Vansant.

Franklin Manufacturing Company, Franklin, Pa.—Century asbestos smoke jacks, patented, asbestos reinforced corrugated roofing or siding, asbestos building lumber and asbestos Century shingles, asbestos steam pipe coverings, wool felt pipe coverings, asbestos cements, asbestos rope and wick packings, Ambler asbestos ring air pump and throttle packings, 85 per cent magnesia boiler laggings. Represented by R. J. Evans, Geo. S. Stuart, Harry S. Hayward, L. B. Melville, Wallace W. Johnson.

Franklin Railway Supply Company, Franklin, Pa.—Franklin automatic driving box lubricator, McLaughlin metal flexible conduit, Franklin pneumatic fire door, Franklin automatic connector, Franklin hydraulic jack, Miser-Shaff water gage, Holland flexible joint, Franklin grate shaker, Terry grease plug, O'Connor fire door flange. Represented by J. S. Coffin, Samuel G. Allen, B. Haskell, A. G. Elvin, W. H. Coyle and Paul Weiler.

Frost Railway Supply Company, Detroit, Mich.—Harvey friction draft springs of various sizes, Detroit metal weather strips for coach windows, with models. Represented by Harry W. Frost, George A. Cooper and George L. Harvey.

Galena-Signal Oil Company, Franklin, Pa.—Reception booth. Represented by J. S. Coffin, V. P.; E. V. Sedgwick, H. Hillyer, Alex. Turner, J. A. Roosevelt, F. W. Dyer, E. H. Baker, F. A. Guild, B. H. Grundy, W. A. Trubee, G. L. Morton, L. H. Palmer and E. W. Grieves.

Garlock Packing Company, Chicago.—Metal and fibrous packings for locomotives and shop machinery. Represented by John N. Todd, Wm. Smith, F. A. Ebert, H. N. Winner and H. Peterson.

General Compressed Air & Vacuum Machinery Company, St. Louis.—Pneumatic railroad car cleaning truck with tool box and with automatic control valve, complete set renovators and cleaning tools, set of fittings (special) all in actual operation. Represented by Reuben C. Hallett and Frederic A. Coolidge.

General Electric Company, Schenectady, N. Y.—Railway motors G. E. 205, G. E. 209, G. E. 69 and G. E. 308 (No. 205 is designed for the Detroit tunnel railway); locomotive headlight set operated by small Curtis turbine, also 20 kilowatt train lighting set, Tantalum train lamps, switch panels for car lighting, application of motors to different tools, Universal saw bench, band saw, speed lathe. Represented by J. G. Barry, F. H. Gale, R. E. Moore, W. J. Clark and C. C. Pierce.

General Railway Supply Company, Chicago.—Metallic (steel) sheathing, National steel trap doors and lifting device, Schroyer friction curtain rollers and fixtures, Garland ventilators, National standard roofing, Flexolith composition flooring, Ideal roller center bearings, National automatic vestibule curtain catches. Represented by H. U. Morton, F. L. Wells and L. C. Bassford.

Gisholt Machine Company, Madison, Wis.—Motor driven 52-inch vertical boring and turning mill with two swivel heads, 24-inch Gisholt "Big Bore" lathe with 6¼-inch spindle hole, motor driven; Gisholt universal tool grinder for lathe and planer tools, motor driven. Represented by G. E. Gernon, Stanley C. Hanks, E. F. Muther, C. B. Carr, Charles Spalding and J. E. Brandt.

Gold Car Heating & Lighting Company, New York.—Railway car heating and lighting apparatus. Represented by E. E. Gold, W. E. Banks, E. B. Wilson, W. H. Stocks, J. M. Stayman, F. A. Purdy, G. F. Ivers, H. L. Leach, G. F. Collins, F. T. Kitchen, J. O. Brombaugh and R. Voges.

Goldschmidt Thermit Company, New York.—Welds on locomotive frames, wrought iron and steel pipes and other steel sections; crucibles, tripods and all necessary appliances for welding with Thermit; samples of Thermit, Nickel Thermit and ignition powder, specimens of metals prepared by the Aluminothermic process, free from carbon, such as chromium, maganese, molybdenum, ferro-vanadium, manganese-copper, manganese-zinc, manganese-tin, ferro-titanium, ferro-boron, chromium-copper. Welding operations on locomotive driving wheel spokes will be carried out at demonstration space, situated just beyond Marine Hall on the Million Dollar Pier. Represented by Henry S. Mann and A. M. Guenther.

Goodwin Car Company, New York.—Full size all steel hopper car, 100,000 pounds capacity. (Track Exhibit.) Represented by J. T. Gilman, L. W. Evans and J. M. Goodwin.

Gould Coupler Company, New York.—Gould M. C. B. couplers, malleable iron journal boxes, side-unlock coupler, miniature freight coupler, miniature tender coupler, Moritz M. C. B. couplers, Gould friction draft gears, cast-steel journal box, special malleable iron draft rigging and striking plates, Crown truck side frame with Crown bolster and Gould journal boxes, Gould steel passenger platform with friction buffer, Crown bolster (that has been tested), Gould special electric locomotive coupler, Hartman ball bearing center plates, Hartman side bearings, frame with Gould body bolster, Gould freight coupler, Gould friction draft gear and steel draft frames, Gould draft gear, new passenger coupler, rightning device and Gould vestibule. Represented by F. P. Huntley, Clarence E. Rood, S. R. Fuller, Jr., W. M. Rogvine, W. F. Richards, T. L. McKeen, Dr. C. W. Gould and H. N. Loomis.

Greene, Tweed & Co., New York.—Favorite reversible ratchet wrench, Palmetto braided and twist packings, Palmetto packing sets for Westinghouse air pumps, Palmetto packing sets for New York duplex pumps. Represented by F. E. Ransley and B. M. Bulkley.

Grip Nut Company, Chicago.—Grip nuts. Represented by Edward R. Hibbard, J. Wm. Hibbard and Herbert Green.

Hale & Kilburn Manufacturing Company, Philadelphia.—Railway car seats and shairs, pressed steel car seats, steel doors and sash, rattan seat covering. Represented by A. F. Old, H. T. Bigelow and B. F. Pilson.

Hanlon & Wilson, Wilkinsburg, Pa.—Vacuum cleaning machine for car cleaning, also for household and hotel use Represented by A. G. Wilson and Miss S. V. Wilson.

Harrington, Son & Co., Edwin, Inc., Philadelphia, Pa.—Plain four-wheeled traveler, to run on the lower flange of I-beam; geared four-wheeled traveler, to run on the lower flange of I-beam; Harrington screw hoist, improved type, one-ton capacity; Harrington Peerless hoist, improved type, one-ton capacity; Harrington differential hoist, one-ton capacity. Represented by Roger Sherron, E. Van Note, W. J. Somerset, R. F. Scott, P. Mullen, Z. B. Coes and A. M. Harrington.

Harvey, George L., Chicago.—Metal car stakes for flat and gondola cars. Represented by George L. Harvey.

Heywood Brothers & Wakefield Company, Wakefield, Mass.—Car seats. Represented by Bertram Berry.

Home Rubber Company, Trenton, N. J.—N. B. O. sheet packing, N. B. O. tubular gaskets, O. I. M. rod packings for high and low pressure, automobile casings and tubes. Represented by W. J. B. Stokes, Chas. E. Stokes, A. R. Foley and H. M. Royal.

Hunt-Spiller Manufacturing Corporation, South Boston, Mass.—Driving boxes, driving box shoes, Driving box wedges, piston heads, cylinder bushings, cylinder packing, superheater headers, piston valve cages, piston valve packing, false valve seats, eccentrics, eccentric straps, crosshead shoes. Represented by W. B. Leach and J. G. Platt.

Illinois Malleable Iron Company, Chicago.—Brazed steel back driver shoes, twist rod and steel lug car shoes, strap steel back and steel lug car shoes, coach Congdon shoes, twist rod back driver shoes, chilled ends and inserts and steel hook; samples of railroad lock nuts, sample of smoke jacks for round houses, sample of Nokoros unions. Represented by Charles L. Sullivan and E. M. Marshall.

Independent Pneumatic Tool Company, Chicago.—Piston air drills, reaming, tapping and portable pneumatic grinding machines, pneumatic reversible flue rolling and wood boring machines, one-piece pneumatic long stroke riveting hammers, pneumatic chipping, calking, beading and scaling hammers, pneumatic wood saws, close quarter piston air drills, air hose and couplings, pneumatic holders-on and other air appliances, motorcycles. Represented by James B. Brady, W. O. Jacquette, J. D. Hurley, R. S. Cooper, J. P. Bourke, R. T. Scott and Geo. A. Gallinger.

Invisible Roll Screen Company, Brooklyn, N. Y.—Screens for dining cars, parlor cars and other cars to screen against dust and smoke; screens for offices and residences to screen against flies and mosquitoes. Represented by R. A. Bagnell.

Janney Car Coupler Company, E. H., Alexandria, Va.—Janney coupler and lifting device. Represented by E. H. Janney and Louis Storck.

Jenkins Brothers, New York.—Globe, angle, check, cross, radiator and gate valves, Sellers' restarting injectors, Jenkins Brothers patent gage cocks, diamond traps, improved automatic air valves, Jenkins '96 sheet packing, Jenkins Brothers pump valves, Graber indicating automatic water gages, Prouty wire valve wheels, Jenkins gasket tubing, Jenkins discs. Represented by A. C. Langston, J. H. Williams and Frank Martin.

Johns-Manville Company, H. W., New York.—Asbestos and magnesia railroad supplies, 85 per cent magnesia locomotive boiler lagging, pipe covering, asbestos and rubber packings for all purposes, including Kearsarge, Vulcabeston and Keystone; asbestos cement, asbestos wood, asbestos Transite lumber, asbestos roofing, Keystone hair insulator, asbestos mill board and fire felt sheets, Kearsarge handhole and manhole gaskets, J-M sectional conduit for underground insulation. Phœnix smoke jacks, linolite, electric fuses, blocks and switches, Victor combination meter, Magic boiler compound, Morris metallic packing and vitribestos linings and coverings. Represented by J. E. Meek, C. W. Gearhart, J. C. Younglove, S. B. Keys, E. C. Sawyer and T. G. Smallwood.

Johnson, Sinclair J., New York.—Model of New Era journal box and lid. Represented by Sinclair J. Johnson.

Justice, Philip S. & Co., Philadelphia, Pa.—Forty-ton "Reliance" hydraulic jack, 30-ton hydraulic jack, 25-ton hydraulic car box jack. Represented by Philip Justice Mitchell and O. L. Wright.

Kelly-Arnold Manufacturing Company, Wilkes-Barre, Pa.—Automatic air and steam connector. Represented by G. F. Rayer and J. T. O'Donnell.

Keystone Drop Forge Works, Chester, Pa.—Keystone connecting link, Keystone safety shackle hook, special locomotive and car forgings. Represented by Geo. H. Berlin.

Lackawanna Steel Company, Buffalo, N. Y.—Transparency illustrating entire plant and furnaces, steel works, mills, etc., in operation, also arrangements for handling material as well as specialties made of steel, installed. Case of sections, showing rolled shapes of open hearth steel made into I-beams, channels, angles, flats, squares, sheet bars and special shapes. Case of sections, showing Bessemer steel products in standard and light rails, splice bars, patent rail joints, tie plates, blooms, billets, etc. Exhibit of sheared and universal plates, car axles, steel tie, patent rail, and patent hook shoulder tie plate. Complete exhibit of Abbott rail joint plates, samples of concrete bars, including full set of tests. Lackawanna steel sheet piling. Represented by A. W. Starke, D. H. Van Pelt and F. E. Abbott.

Lancaster Machine & Knife Works, Lancaster, N. J.—Oval taper drill sockets and drills, lathe with shape attachment, bit braces, machine knives. Represented by W. J. Cant and R. J. Cant.

Landis Machine Company, Waynesboro, Pa.—Single head bolt cutter, motor driven. Represented by W. C. Gladhill.

Landis Tool Company, Waynesboro, Pa.—Universal tool grinder, motor driven; No. 3 Universal tool grinder, finished samples of work done by the machines. Represented by J. H. Hollinger.

Latrobe Steel & Coupler Company, Philadelphia, Pa.—Couplers, cast steel coupler yokes, auxiliary couplers, and Goodman wrecking hooks. Represented by J. G. Robinson and E. O. Warner.

Lawrenceville Bronze Company, Pittsburg, Pa.—Corinthian bronze driving boxes, McGillivray hydraulic valve, rod brass, journal bearings, Robertson blow-off valves, bevel wheel and shafting, finished; worm wheel in the rough and finished; 3-way tuyere cock; 2-way tuyere cock; assortment of unions, bevel wheel, pinions; 3-inch hose coupling with and without cap. Represented by Ed. Kerr and C. B. Ault.

Locomotive Appliance Company, Chicago.—Locomotive cylinders and valves, Allfree patent; Newton wrecking frogs. Represented by C. E. Walker, J. B. Allfree.

Lodge & Shipley Machine Tool Company, Cincinnati.—Patent head screw cutting engine lathe, 24 inches by 12 feet, motor driven, with ten-horse power Triumph 2 to 1 variable speed motor; three step cone screw cutting engine lathe, 16 inches by 8 feet, with Derrer attachment for turning odd shapes. Represented by R. G. English.

Love Brake Shoe Company, Chicago.—Armbrust steel connector locomotive driver shoes, flanged coach shoe, unflanged car shoe, electric railway brake shoes. Represented by C. W. Armbrust, W. H. Colebrook, Joy Love, D. L. Billings and Sydney Stein.

Lucas Machine Tool Company, Cleveland, Ohio.—No. 3 Precision horizontal boring, drilling and milling machine, railroad pattern power forcing press. Represented by W. L. Cheney and George A. Yost.

Lupton's Sons Company, David, Philadelphia.—Fireproof windows, Lupton hollow metal fire doors, Lupton rolled steel skylight, Waldmire louvres, Pond operating device for pivoted sash and louvres. Represented by Clarke P. Pond and John W. Watkins.

McConway & Torley Company, Pittsburg.—Pitt and Janney X freight couplers, Buhoup 3-stem passenger equipment, improved Janney passenger coupler, pivoted tender coupler, the Janney radial coupler for electric and interurban service. Represented by Stephen C. Mason, E. M. Grove, Wm. McConway, Jr., G. W. McCandless, H. C. Buhoup and I. H. Milliken.

McCord & Co., Chicago.—McCord journal box, National equalizing wedge, McCord spring dampener, McCord draft gear, McKim gasket, McCord force feed locomotive lubricator. Represented by J. A. Lamon, W. J. Schlacks, Wm. May, H. H. Newsom and D. W. McCord.

McIlvain, J. Gibson & Co., 1420 Chestnut St., Philadelphia.—A collection of woods, all of which are selected specimens. Represented by J. Gibson McIlvain, Jr., B. James McCormick, Thomas A. Dalton and Franklin H. Bogardus.

Marshall & Huschart Machinery Company, Chicago.—Various kinds of railroad machinery. Represented by Allen Ransom, George Stansbury and Geo. W. Hurd.

Mason Regulator Company, Boston.—Locomotive reducing valves, standard reducing valves for steam, water and air, balanced and lever valves, double seated and piston type, steam pump, damper regulator, gravity pump governor, air brake regulator, pump pressure regulators and Mason speed governors. Represented by F. A. Morrison and Eldon MacLeod.

Massachusetts Mohair Plush Company, Boston.—Plain and figured car plushes in a variety of colors. Represented by Joseph S. Seabury.

Michigan Lubricator Company, Detroit, Mich.—2, 3, 4 and 5-feed Michigan bullseye locomotive lubricators, 3-feed Michigan by-pass locomotive lubricator, Michigan air pump lubricator, Michigan locomotive automatic drain valves, Michigan stationary engine and compressor lubricators. Represented by Jno. B. Corliss and W. E. Bryant.

Modoc Soap Company, Philadelphia.—Perfectol car, locomotive and signal blade cleaner, Perfectol renovator for inside of cars, Perfectol metal polish. Represented by Henry Roever and Jas. McD. Holtzinger.

Mummert, Wolf & Dixon Company, Hanover, Pa.—Plurality Die bolt cutter, revolving oilstone edge tool grinder, revolving oilstone universal grinder, revolving oilstone scraper sharpener. Represented by E. S. Wolf and Clarence Buckey.

Murray, S. W., Milton, Pa.—Box car door, grain door, telescope stake. Represented by S. W. Murray.

Nathan Manufacturing Company, New York.—Injectors, lubricators, general boiler appliances. Represented by E. S. Toothe, J. C. Currie, Jas. Minor, Chas. Kearns and L. Kassander.

National-Acme Manufacturing Company, Cleveland, Ohio.—Acme automatic multiple spindle screw machines with independent motor drive, Acme automatic multiple spindle screw machines with single belt drive. Represented by W. B. D. Alexander, W. S. Chase, E. C. Woolgar and J. F. Judd.

National Aniline & Chemical Company, Philadelphia.—Steelkote paints, of various grades for steel cars, under frames, body and truck bolsters, steel structures, bridges, signal towers, etc. Represented by Mr. J. W. Starr, 3d, Mr. W. C. Skinner, Mr. Charles R. Day and Mr. W. H. F. Tenney.

National Boiler Washing Company, Chicago.—National boiler washing system, flexible copper tubing, blow-off valves, Atlas side bearing. Represented by W. White.

National Car Coupler Company, Chicago.—National passenger and freight couplers, engine couplers, Sampson and Midget couplers for industrial cars, couplers for interurban service, National centering yoke, and Hinson emergency knuckle; center plates, wrecking frogs, switch points, heels and risers, blank gears, pinions and gears, chain blocks and cutter heads for coal mining machines. Represented by J. W. Harrison and W. A. Ruth.

National Lock Washer Company, Newark, N. J.—Window fixtures, curtain fixtures, sash balances and sash locks, also the National Lock Washer. Represented by W. C. Dodd, Daniel Hoyt, F. B. Archibald and John B Seymour.

National Malleable Castings Company, Cleveland, Ohio.—Tower, Climax and Vulcan couplers, National and Climax journal boxes, railway specialties. Represented by S. L. Smith, J. V. Davison, R. T. Hatch, H. D. Hammond, Roy Wright, W. E. Coffin, Chas. A. Bieder, J. J. Manning, Geo. V. Mardin, O. W. Loomis, K. R. Johnston, Benj. Nields, Jr., W. G. Kranz and F. R. Angel.

National Roofing Company, Tonawanda, N. Y.—Asphalt roofings, paints, casting dip, boiler and stack paint and asphalt cement. Represented by C. H. Newell, George W. Cullen and J. J. Case.

National Tube Company, Pittsburg, Pa.—Seamless steel tubing, seamless steel locomotive bells, seamless steel gongs, seamless steel locomotive tubes, safe ends, Kewanee unions, High Duty Metal valves, extra heavy iron body valves, Kewanee flange unions, flanged fittings, Y valves, National telescopic car stake. Represented by Geo. N. Riley, James G. Bateman, E. D. Gilberson, L. R. Phillip, L. F. Hamilton, C. R. Cumming and H. C. Brown.

New York Air Brake Company, New York.—Automatic hose connector, Forsyth patent safety train order signal. Represented by Wm. T. Henry, H. F. Bickel, Wm. Owens, P. Lovell, N. A. Campbell and J. E. Forsyth.

Norton Company and Norton Grinding Company, Worcester, Mass.—Mounted car wheels, showing tires with flat spots and tires from which flat spots have been removed on Norton car-wheel grinder; steel piston rods finished with Norton Alundum wheels on Norton grinding machines; a complete illustrative line of Norton grinding wheels made of Alundum; a complete illustrative line of India oil stones manufactured by Norton Company, samples of miscellaneous work ground by Norton Alundum wheels. Represented by C. O. Smith, H. N. Cudworth, Wm. L. Neilson and G. C. Montague.

Norton, A. O., Inc., Boston.—Norton ball bearing jacks. Represented by Harry A. Norton, Jos. O. St. Pierre, F. L. Gormley and B. B. Terrill.

Noscalon Company, New York.—Fire engine Noscalon machine, locomotive Noscalon machine, pawl and ratchet Noscalon machines, 100 and 350 horsepower, Noscalon material, samples boiler scale. Represented by W. H. Stevens, J. J. Healey, Jr., R. T. Weaver and Paul Gleises.

Oil Well Supply Company, Pittsburg, Pa.—Railroad specialties, brass valves for locomotives and malleable iron fittings. Represented by J. C. Bruff and D. J. Brown.

Pantasote Company, New York.—Pantasote car curtains and seat coverings, also an extensive exhibit of their new product Agosote for head linings, panels and partitions. A model of Agosote head lining with water running over it to show its water proofing qualities. Represented by John M. High, D. E. Bonner and Geo. N. Boyd.

Parker Car Heating Company, L't'd, London, Ont.—Parker anti-freezing and hot water system of car heating. Represented by Thomas Parker, John M. McEvoy, C. S. Parker, Jr., and Geo. H. Bryant.

Parkesburg Iron Company, Parkesburg, Pa.—Reception booth. Represented by H. A. Beale, Jr., A. J. Williams, Geo. Thomas, 3d, J. R. Humpton, C. L. Humpton, W. H. S. Bateman, H. Leora Maule and Amy T. Wright.

Perry Side Bearing Company, Chicago.—Old bearings in use from four to six years. One set from Chicago & Northwestern, with 270,000 miles service, new model for steam or trolley cars. Represented by H. M. Perry.

Phoenix Iron Works Company, Meadville, Pa.—Photographs, blue prints and literature describing high speed automatic cut-off engines, boilers, tanks and feed water heaters. Represented by John Dick.

Pilliod Company, Chicago.—Baker-Pilliod locomotive valve gear. Represented by C. J. Pilliod, H. J. Pilliod and F. E. Pilliod.

Pittsburg Automatic Vise & Tool Company, Pittsburg, Pa.—Two-way high speed vises, single swivel vises, pipe vises, automobile-motor boat vises, railway vise (very large), woodworkers' vises. Represented by G. P. Blackiston.

Pittsburg Equipment Company, Pittsburg, Pa.—Two cast steel side bearings, one with cast steel journal box attached, cast steel spring flank, cast steel end casting, cast steel end with spring seat cast on, one spring seat. Represented by O. S. Pullian and H. V. Seth.

Pocket List of Railroad Officials.—New York copies of the Pocket List. Represented by J. Alexander Brown and Chas. L. Dinsmore.

Railroad Age Gazette, New York and Chicago.—Represented by E. A. Simmons, R. S. Chisolm, F. S. Dinsmore, L. B. Sherman, Jno. N. Reynolds, C. R. Mills, C. F. Albertson, Hugh M. Wilson, Daniel Royse, William Forsyth, F. W. Lane, C. H. Fry, George L. Fowler, S. O. Dunn, P. P. Fodrea, J. N. Nind, Jr., F. E. Lister, H. D. Horton, Miss Jennie Boyd and T. E. Crossman.

Railway List Company, Chicago—Represented by W. E. Magraw and C. S. Myers.

Railway Materials Company, Chicago.—"Rymco" Journal Boxes. Represented by Geo. L. Bourne, C. H. True, Geo. Hoeffle and C. M. Mendenhall.

Railway & Engineering Review, Chicago.—Represented by Willard A. Smith, Harold A. Smith, A. E. Hooven, Jos. F. Reed and W. E. Magraw

Ralston Steel Car Company, Columbus, Ohio.—Booth exhibit, models of steel underframe construction; track exhibit, gondola dump car of 100,000 pounds capacity; general service, box and stock cars of 80,000 pounds capacity. Represented by J. S. Ralston, J. E. Tesseyman, L. C. Brown and John L. Connors.

Restein Clement Company, Philadelphia.—Belmont packings for steam, water, ammonia, hydraulics, oil, gases, acids, etc.; steam hose, boiler washout hose, air pressure hose, water hose and tender hose; air pump and throttle packing. Represented by Clement Restein, Jules Restein, Norman B. Miller, W. R. Finnigan, James E. Sulger and E. N. Marcy.

Ritter Folding Door Company, Cincinnati.—Folding roundhouse, machine shop and depot doors. Represented by J. M. Crowe, W. Moore Wharton, C. D. Porterfield and H. O. Comstock.

Roberts & Schaefer Company, Chicago.—Photographic enlargments of Holmen type, belt conveyor type and the Holmen-Barrett type locomotive coaling stations. Represented by E. E. Barrett.

Robinson Company, Boston.—Robinson exhaust nozzle and Robinson rail anchor. Represented by Charles L. Snow, Frederic Parker and Frank Robinson.

Rubberset Brush Company, Newark, N. J.—Paint brushes for railroad use. Represented by A. L. Holtzman.

Rudd Manufacturing Company, Pittsburg, Pa.—Water heaters.

Russell, Burdsall & Ward Bolt & Nut Company, Port Chester, N. Y.—Machine bolts, carriage bolts, cold punched nuts, case hardened nuts, semi-finished nuts, castellated nuts, rivets, washers and brass goods. Represented by R. B. M. Cook, John Abel and T. S. Hickcox.

Rutherford Automatic Connector Company, Chicago.—Air hose connector for railway cars of all kinds. Represented by F. H. Rutherford and C. H. Carman.

Ryerson, Joseph T. & Son, Chicago.—Lennox rotary bevel shear in operation, Ryerson high speed friction saw, flue welding machine, crank pin truing machine, portable automatic key-seating machine, valve seat facing machine, boring bar and punch and shear. Represented by Gilbert H. Pearsall, Edward T. Hendee, Frederick A. Gardner, Louis M. Henoch and John C. Kunzer.

Safety Car Heating & Lighting Company, New York.—All the apparatus for lighting cars by Pintsch system, showing both mantle and flat flame lamps, vapor system of lighting, axle light system in operation, steam heating ap-

paratus including jacket system, new direct steam regulating system, all types of steam coupling, expansion and thermostatic traps, reducing valves, quick opening and train pipe valve operated from platform, improved safety valve and combination cock for expansion drums and sections of jackets and steam traps. Represented by R. M. Dixon, L. R. Pomeroy, D. W. Pye, William St. John, W. H. Hooper, C. B. Adams, W. L. Garland, J. H. Henry, A. C. Moore, G. E. Hulse, W. I. Thomson, J. M. Towne, H. G. Thompson, G. H. Chadwell and H. G. Darnell.

St. Louis Car Company, St. Louis.—Car seats, rattan goods, spiral journal bearings. Represented by A. H. Sissons, R. G. Hutchins and C. B. Hutchins.

Sargent George H., Chicago.—Sargent rerailers. Represented by George H. Sargent.

Scullin-Gallagher Iron & Steel Company, St. Louis.—Cast steel body and truck bolsters, cast steel M. C. B. coupler. Represented by Thos. M. Gallagher, R. H. Weatherly, B. V. H. Johnson, S. M. Dolan, F. L. Norton, R. B. Clark, Jr., James Timms and P. J. Howard.

Scully Steel & Iron Company, Chicago.—"Everlasting" blow-off valves, Scully flue-hole cutters, Lucas pneumatic tube expanders, Lovejoy roller expanders, Scully improved ball-bearing expanders, Kelly tube-flaring tools, railroad flue cutters, stay-bolt taps, spindle stay-bolt taps, reversible stay-bolt chucks, Scully stay-bolt headers, cone-bearing ratchet screw jacks, Wangler bevel shears, Scully rotary splitting shears, Bender steel grain doors, and Wood's patent flue sheet and fire-box. Represented by W. H. Dangel, T. T. Cavanagh, C. F. Lape, J. S. Bender, J. H. Allen, F. L. Patterson, Wm. H. Wood and Alexander B. Scully.

Sellers, William & Co., Inc., Philadelphia.—Working exhibit of No. 1 and No. 2 tool grinding and shaping machines, and drill grinding machine; working exhibit of 1908 non-lifting injector, with attached automatic lazy cock; sectional models of locomotive and stationary injectors, stop check valves, strainers, etc. Represented by Strickland L. Kneass, Charles T. Wilson, John D. McClintock and C. B. Conger.

Smith Company, William J., New Haven, Conn.—Smith one-lock and micrometer adjustable reamers. Represented by G. C. Parker.

Sprague Electric Company, New York.—Interlocking steel armored air brake and signal hose with standard fittings for railroad service, interlocking steel armored hose with fittings for the transmission of air, water and steam, steel armored cable and flexible steel conduit for interior and exterior electrical wiring, outlet and switch boxes and conduit fittings. Represented by Allan C. Bakewell, Harry H. Hornsby, W. L. Williams and Alfred E. Braddell.

Springfield Machine Tool Company, Springfield, Ohio.—High power rapid reduction lathe, 19 inches capacity, with oil pan and pump, and 7½ horsepower motor attached. Represented by Paul A. Montanus and Edward S. Montanus.

Standard Car Truck Company, Chicago.—Tender truck, freight truck, roller bearing center plates, ¼ size double action truck models, four ⅛ size truck models. Represented by J. C. Barber, Lee W. Barber and E. W. Webb.

Standard Coupler Company, New York.—Reception booth. Represented by George A. Post, George A. Post, Jr., A. P. Dennis and E. H. Walker.

Standard Metal Manufacturing Company, Chicago.—Brass castings, bronze castings, car brasses, locomotive brasses, Babbitt metals. Represented by Donald C. Barbee and Carl Penner.

Standard Paint Company, New York.—Ruberoid roofing for buildings and for box cars and refrigerator cars, insulating papers for refrigerator cars and cold storage work, iron and wood preservative paints, insulating varnishes. Represented by J. N. Richards, J. H. Thomas and J. G. Satterthwait.

Standard Steel Car Company, Pittsburg, Pa.—On exhibit track a pressed steel box car.

Sterling Steel Foundry Company, Pittsburg, Pa.—Sterling automatic freight couplers and pilot couplers, open hearth cast steel locomotive frames, open hearth steel plantation car wheels. Represented by H. E. Wainwright, Jr., Uriah Tinker, Geo. J. Chandler, J. F. Robertson and J. W. Barth.

Stoever Foundry & Manufacturing Company, Lebanon, Pa.—3-inch motor driven pipe threading machine, with new type of nipple chuck. Represented by Ralph McCarty and Ed. R. Euston.

Storrs Mica Company, Owego, N. Y.—Small mica chimneys on incandescent gas lights, to illustrate the heat resisting qualities of the mica used in "Never Break" mica headlight and caboose lamp chimneys. Represented by A. P. Storrs and Charles P. Storrs.

Symington Company, T. H., Baltimore, Md.—Journal boxes, ball bearing center and side bearings, malleable iron car castings, locomotive castings of "Refined Iron." Represented by T. H. Symington, J. F. Symington, Donald Symington, C. J. Symington, W. W. Rosser, T. C. deRosset and A. H. Weston.

Tindel-Morris Company, Eddystone, Pa.—High duty cold sawing machines and inserted teeth high speed steel saw blades for high duty. Represented by L. N. Gruber and Lane Schofield.

Trojan Car Coupler Company, New York.—Junior automatic car couplers. Represented by Henry D. Dumont and Charles C. Mickle.

Underwood, H. B. & Co., Philadelphia.—Standard portable boring bars for locomotive cylinders, rotary planing machine for valve seats on locomotives, portable locomotive frame pedestal planer, new design crank pin turner and reborer, two-cylinder air or steam motor for driving portable tools, portable pipe bending machine. Represented by A. D. Pedrick.

Union Spring & Manufacturing Company, Pittsburg, Pa.—Coil and elliptic springs, pressed steel journal box lids and spring plates, Kensington all-steel journal box. Represented by A. M. McCrea, L. G. Woods, C. S. Foller, A. Stucki, T. B. Arnold and A. C. Woods.

U. S. Metal & Manufacturing Company, New York.—"Ureco" pneumatic track sander in operation, Davidson locomotive raiser, "Perfect" pressed steel car replacer, "Victor" cast steel car replacers, Columbia lock nuts, Western M. I. brake jaws, Feasible drop brake staff, Cliff & Guibert fire hose reel, Hillman locked clevis and turnbuckle, St. Louis Surfacer & Paint Company's coach and car (metal) surfacer finished on wood, coach, car and locomotive (metal) surfacer finished on metal, sheet canvas treated with "Metal" canvas preserver and "Metal" canvas roof paint, panels of "Metalsteel" paint, metal floor paint and locomotive, truck, cab and caboose enamels. Exhibition car on Mississippi Avenue track equipped with Dunham hopper door device, Feasible drop brake staff, Columbia lock nuts and painted throughout with the product of the St. Louis Surfacer & Paint Company. Represented by B. A. Hegeman, Jr., M. Jackson Crispin, G. L. L. Davis, F. C. Dunham, E. D. Hillman, Fred Atwater, John Varian and Henry Rau, Jr.

Uwanta Wrench Company, Meadville, Pa.—Monkey wrenches, combination wrenches. Represented by G. P. Bain.

Van Dorn Company, W. T., Chicago.—Steel car end. Represented by W. J. Van Dorn and John Sjoquist.

Ward Equipment Company, New York.—Heating apparatus for railway cars and locomotives, Ward steam couplers, in three sizes; Ward's end train pipe valves, automatic steam traps, pressure regulators, starting valves, steam gages and a complete line of fittings and other improved attachments for use in connection with car and locomotive heating equipment; Ward's car ventilator and Ward's automatic connector for steam, air and signal. Represented by John E. Ward, A. E. Robbins, Henry J. Horn and F. H. Bates.

Watson-Stillman Company, New York.—Hydraulic jacks, portable shaft straighteners, hydraulic rail benders, independent pump jacks, hydraulic crank pin presses, hydraulic wheel presses. Represented by George L. Gillon and Edward A. Johnson.

West Disinfecting Company, New York.—Liquid soap, Beau Brummel liquid soap disinfectants, disinfecting appliances, sprayers, fumigating apparatus and products. Represented by E. Taussig, Chas. Auerbach and R. M. Fort.

Western Railway Equipment Co., St. Louis.—Acme brake slack adjusters, Western sill and carline pockets, Hoerr tandem draft gear, Linstrom eccentrics, Linstrom syphon pipes, Western bell ringer, car door fastenings, Economy slack adjusters, Western truck end castings, brake pins, Acme pipe clamps, Hoerr car doors, Western flush car doors, Missouri car doors, interchangeable car doors, St. Louis flush car doors, Downing card holders, Western brake jaws, Western angle cock holder, fish hook tie plates, Western tie markers. Represented by Louis A. Hoerr and S. H. Campbell.

Western Tool & Manufacturing Company, Springfield, Ohio.—Champion tool holders, Champion expanding mandrels, portable or movable benches, T-bolt heads, automobile non-clogging flue brush, screw feed tube expander and cutter, lathe dog, center oilers and cleaners, steel. Represented by Henry Morris, Robert J. Saim and E. V. Galen.

Westinghouse Air Brake Company, Pittsburg, Pa.—Reception booth. Represented by Jos. R. Ellicott, E. L. Adroon, E. A. Craig, F. T. Reese, S. J. Kidder and C. J. Olmstead.

Wheel Truing Brake Shoe Company, Detroit, Mich.—Various styles of abrasive brake shoes for truing up locomotive driver wheels and coach wheels. Represented by J. M. Griffin.

White Enamel Refrigerator Company, St. Paul., Minn.—Bohn's syphon system for refrigerator and dining cars. Represented by Gebhard Bohn and G. C. Bohn.

Willard Storage Battery Company, Cleveland, Ohio.—Storage batteries for train lighting and for signal work. Represented by T. A. Willard, Robt. C. Shaal, C. C. Bradford and R. Norberg.

Wilmarth & Morman Company, Grand Rapids, Mich.—Five new Yankee drill grinders, as follows: one direct connected motor driven, style "D;" one wet grinder, style "PO;" one dry grinder, style "J A Point;" one bench grinder, style "L;" one combination cutter, reamer and drill grinder, style "BX;" also one new surface grinder and one Nelson loose pulley. Represented by Chas. E. Meech and S. Owen Livingston.

Wilson Manufacturing Company, Jas. G., New York.—Improved slat door with interlocking joints, specially designed for freight house doors, operated by chain gearing; continuous corrugated door with reinforced edges, sections of the wood slat door for round houses. Represented by A. H. Dodge.

Wolff Truck Frame Company, Chicago.—Divided journal box frames, removable bolster retaining bar frames, solid type truck frames. Represented by F. A. Lester.

Wright Wrench Company, 3044 Chestnut St., Philadelphia.—Rapid adjustment monkey wrench. Represented by J. F. Wright and Bernard J. Crandley.

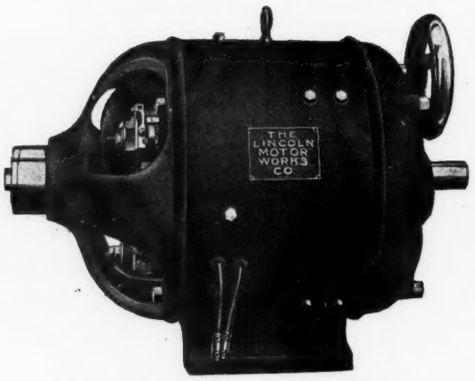
Yale & Towne Manufacturing Company, New York.—Electric "Triplex" hoists, overhead trolleys, chain blocks, Blount coach door checks, pad locks, station hardware, enlarged operating model of Yale lock, and coach cabinet locks. Represented by W. C. Bigelow, F. A. Hall and C. W. Beaver.

BETTENDORF ALL-STEEL BOX CAR.

One of the newest features in car work is exhibited by the Bettendorf Axle Company, of Davenport, Iowa. This is an all-steel box car of novel design. It consists of a single center sill, steel underframe, with 3-inch I-beam posts which form the carlines and arch continuously from side sill to side sill. Flanged steel sheets form the roof and sides, and these are riveted to the webs of the posts, the flanges of the latter being on the outside; as a result no rivets are to be seen on the outside of the car roof or sides. The floor is of standard 1¾-inch car decking, while the distinctive feature is the fact that the car can be used either with or without lining. If the latter way is desired, the lining can be put in at only a small expense. The lining is 1¾ inches thick and each piece is but a few feet in length, being made just long enough to fit in the space between the I-beam posts and it is held in place by the post flanges. This scheme allows a railroad to use old cull flooring and take out or place in lining as desired.

THE LINCOLN VARIABLE SPEED MOTOR.

An interesting feature in the individual motor driving of machine tools, which will appeal to superintendents and foremen of machine shops, has been developed by the Lincoln Motor Works Company of Cleveland, Ohio, in its armature shifting type of motor. With the Lincoln motor the starting and stopping handle of the rheostat is entirely independent of the handle on the motor which controls the speed so that if a Lincoln variable speed motor is set for the correct cutting speed, every time the motor is stopped for calipering the work



The Lincoln Variable Speed Motor.

or any similar cause and again put in operation, the machine tool starts at the exact speed which it is set for, and there is no chance for a mistake, such as is liable to occur with a controller having a large number of steps. Where unskilled labor is employed, the Lincoln method of drive has the advantage that the speed control can be situated in a convenient place for the foremen or some skilled machinist to fix the speed and the operator running the machine will only have conveniently at hand the starting and stopping rheostat. By thus separating the speed regulating and the starting and stopping devices unauthorized changes in speed, for whatever reason, by machinists are rendered easier to detect.

Illinois Malleable Iron Company.

The brake shoe department of the Illinois Malleable Iron Company calls attention to its special steel back driver and car shoes for which the special claim of safety is made. These shoes have the backs brazed to the bodies with the idea of securing a more perfect union than is secured by casting the bodies to the backs, and making a shoe in which neither heat nor fracture can cause a separation of the back and body. The other brake shoes manufactured by this company include: rod back driver and car shoes, shoes with soft iron bodies and hard inserts, shoes with hard iron bodies and soft inserts, shoes with chilled ends, plain M. C. B. gray iron shoes, shoes specially designed to avoid lug failures and flanged and unflanged shoes. The headquarters of the brake shoe department of the Illinois Malleable Iron Company are at No. 617 Railway Exchange, Chicago.

In addition to the extensive line of pneumatic and electrical tools being exhibited by the Chicago Pneumatic Tool Company in spaces 153, 155 and 157 there will be found a complete line of vacuum cleaning apparatus for hotels, theaters, etc., and particularly for the cleaning of cars. The Chicago Milwaukee & St. Paul has placed an order for five combination dry cleaning and shampooing machines, two of which are to be gasoline driven and three with electric drive. A complete demonstration was made in the railroad company's yards at Chicago, under the direction of the mechanical department, before placing the order.